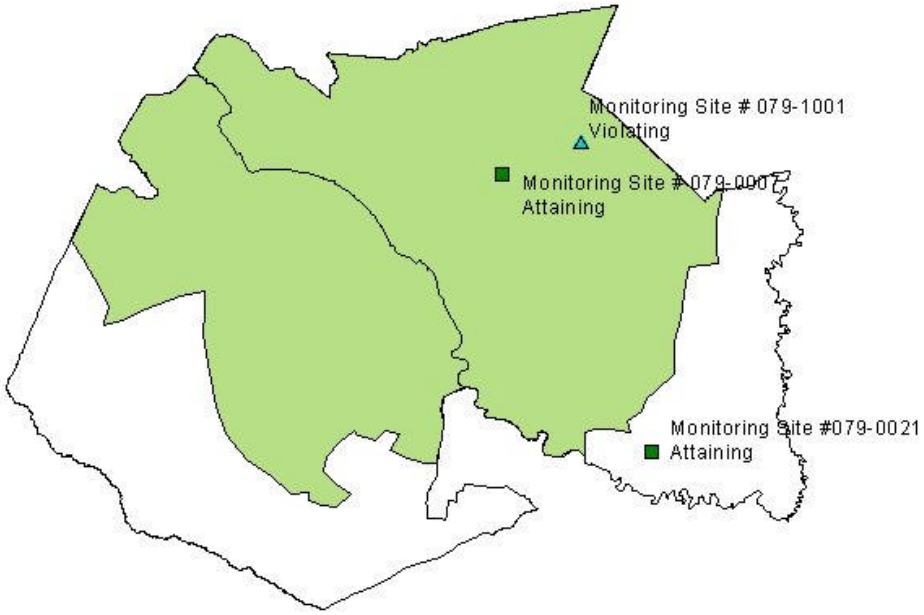
Columbia Nonattainment Area
Boundary Recommendation



Boundary Recommendation

Richland and Lexington Counties

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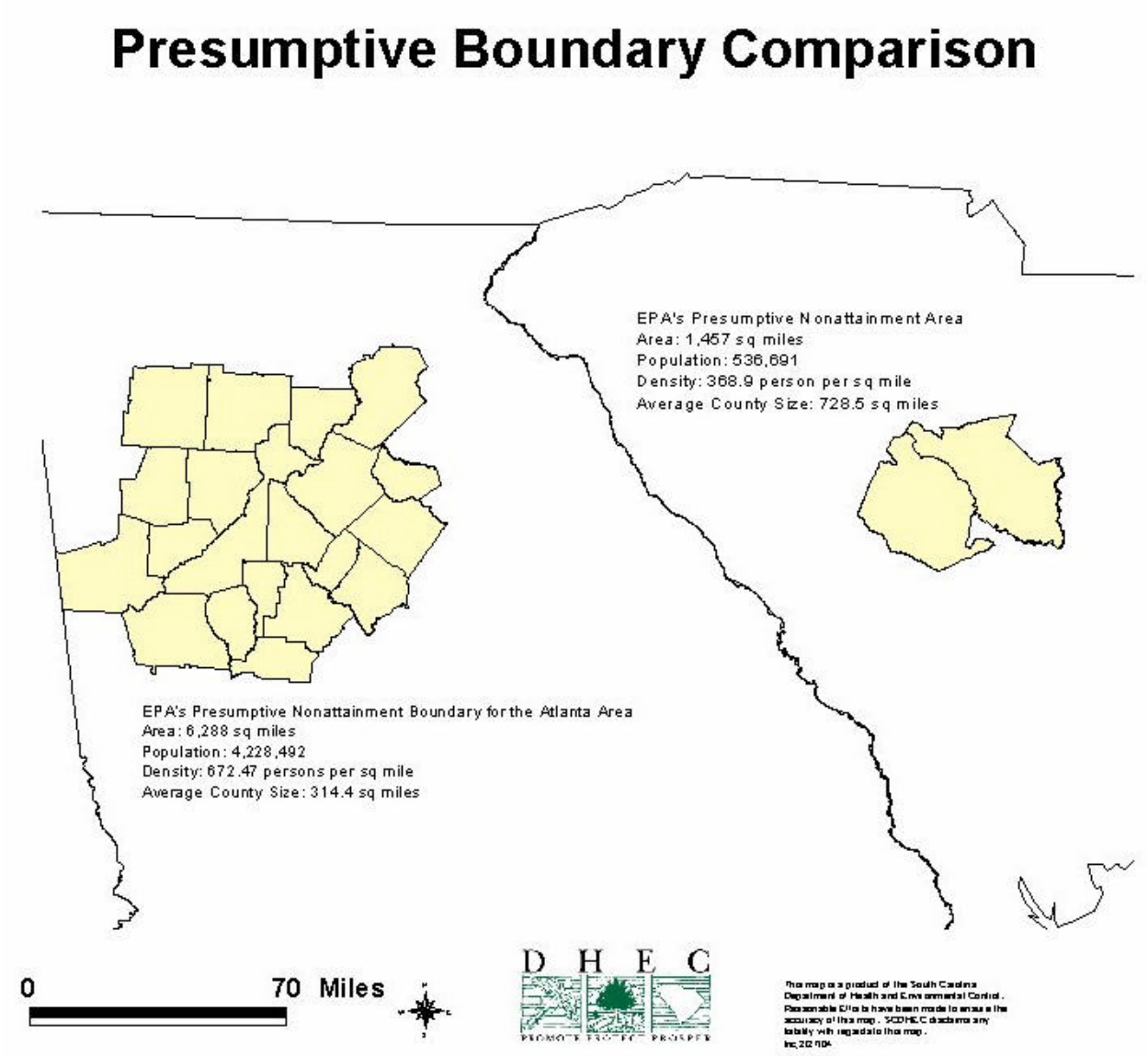
Columbia Nonattainment Area
Boundary Recommendation
Summary

Upon review of the ozone nonattainment area boundary recommendations submitted by the South Carolina Department of Health and Environmental Control (Department) on July 14, 2003, and later amended on November 14, 2003, the United States Environmental Protection Agency (EPA), in a letter dated December 3, 2003, notified the Department of its intent to promulgate designations of nonattainment areas in South Carolina with modifications to the State's recommendations. Specifically, EPA's response indicated that the entire Columbia Metropolitan Statistical Area (MSA), which is based on the 1990 MSA definition, would be designated as the nonattainment area. Such a recommendation would include the full counties of Lexington and Richland. The Department remains firm in its request that only combined portions of the two counties be designated. The Department wishes to take this opportunity to demonstrate why EPA's proposed modifications are inappropriate. The information and data provided below documents, on a technical basis, the Department's reasons for recommending the **combined portions** of Lexington and Richland Counties as a nonattainment area.

Throughout the rest of this summary of the recommended Columbia nonattainment area recommendation, any statistical analysis or evaluation of data will be conducted in comparison to the EPA's presumptive nonattainment area, which includes Richland and Lexington Counties (Columbia MSA).

Based on EPA presumptive boundary sizes, designation of a partial and separate nonattainment area for the Anderson boundary is appropriate. Figure 1 shows a side-by-side comparison of the recommended Atlanta, GA 8-hour ozone nonattainment area and the Columbia, SC MSA, (EPA's presumptive boundary for the midlands). Disturbing observations can be made, given that EPA has indicated that these will be the 8-hour ozone nonattainment boundaries for the respective areas. The two counties that make up the Columbia MSA average 728.5 square miles per county. In contrast, the Atlanta area includes 20 counties with an average size of 324.5 square miles per county. The comparative land areas and populations demonstrate a severe inequity in setting boundaries based on EPA's presumptive boundaries.

Figure 1

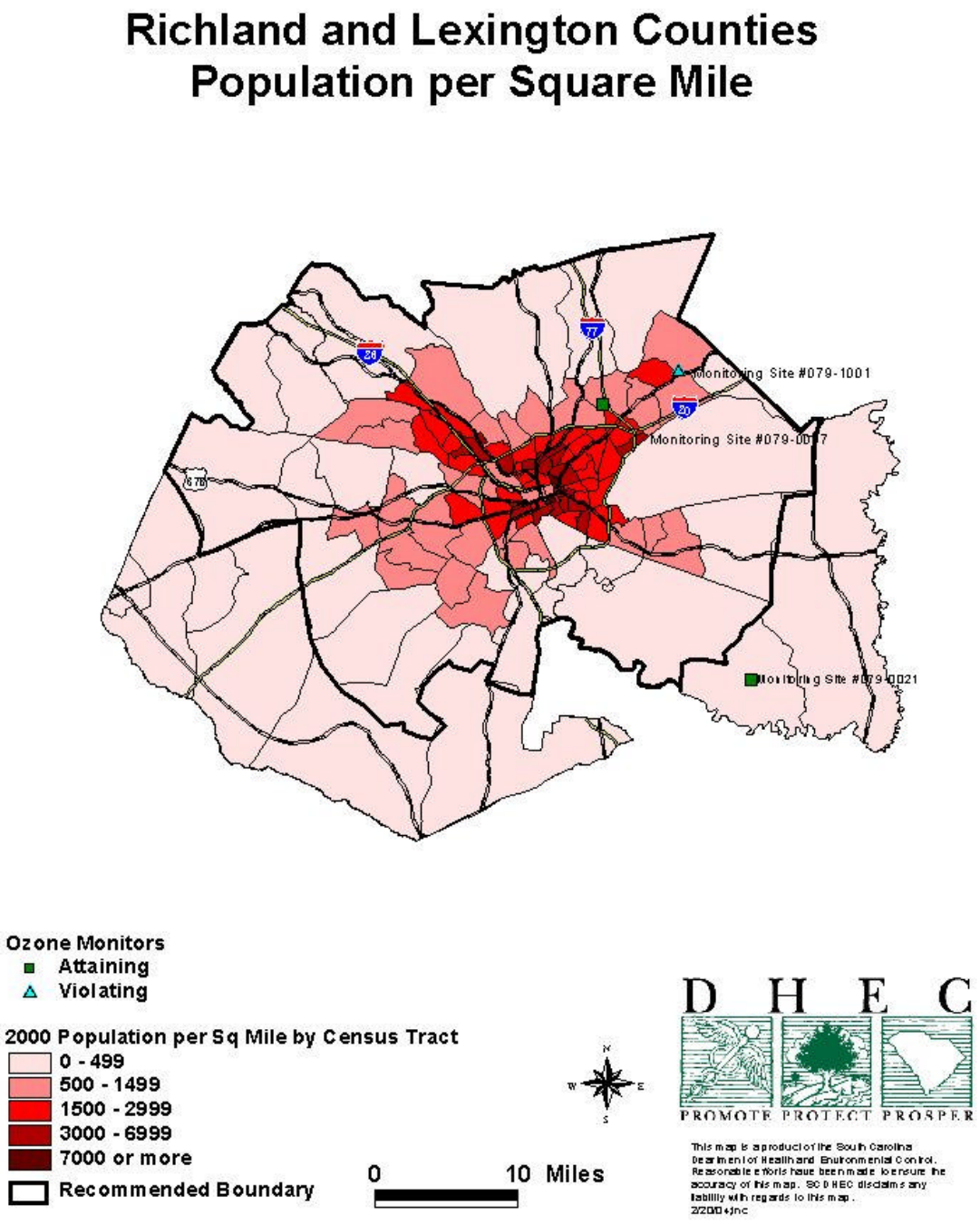


Based on the Clean Air Act, designation of combined partial counties for the recommended Columbia nonattainment area is appropriate. The Clean Air Act's requirement of MSAs or Consolidated MSAs as the nonattainment boundary applies only to areas designated as **serious** and above. Based on the latest draft proposal by EPA concerning implementation of the 8-hour ozone standard, the violating monitors in the Columbia Area would be classified as marginal. The Office of Management and Budget (OMB) has defined metropolitan areas for statistical purposes to include the collection, tabulation, and publication of data by Federal agencies for geographic areas to facilitate the uniform use and comparability of data on a national scale. This was recently confirmed in the December 27, 2000, *Federal Register* notice concerning *Standards for Defining Metropolitan and Micropolitan Statistical Areas* by the OMB. The Department asserts that designating areas under the National Ambient Air Quality Standards is indeed a nonstatistical program. For EPA to default to a presumptive boundary for "consistency" purposes stifles the creativity to improve air quality as expeditiously as possible to bring clean air to the public and rewards those who choose to wait. EPA's broad-brush approach discourages initiatives by local areas, counties, and states to be proactive. Further, for EPA to default to its

presumptive boundaries rather than allowing the use of its published criteria significantly changes Congressional intent and EPA's guidelines to a "presumptive norm."

Based on low population and low population density in the rural areas of Richland and Lexington Counties, designation of combined partial counties for the recommended Columbia nonattainment area is appropriate. In 2000, the Columbia MSA had a population of 536,691, within a land area encompassing 1,455 square miles. The recommended Columbia nonattainment area boundary captures 92.14% of the population, or 494,518 people, within a land area measuring 995.8 square miles. The recommended nonattainment area has a population density of 496.6 persons per square mile (see figure 2). The portions of Richland and Lexington Counties not captured within the boundary are rural in nature, with a population density of only 91.84 persons per square mile.

Figure 2


Richland and Lexington Counties
Population per Square Mile
Monitoring Site #079-1001
Monitoring Site #079-0017
Monitoring Site #079-0021
Ozone Monitors
Attaining
Violating
2000 Population per Sq Mile by Census Tract
0 - 499
500 - 1499
1500 - 2999
3000 - 6999
7000 or more
Recommended Boundary
0
10 Miles
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Based on employee percentages and distribution of economic sector employees, designation of combined partial counties for the recommended Columbia nonattainment area is appropriate. The recommended boundary captures 91.04 percent of the manufacturing employees and 92.53 percent of the manufacturing establishments. Given that the vast majority of the manufacturing and retail trade establishments and employees in the Columbia MSA are located in the recommended area and that the MSA, particularly the recommended area, is predominantly urban, it is reasonably assumed that the majority of the employees and establishments in the county for other industrial categories are contained within the recommended area boundary.

Based on the 2001-2003 quality assured data, designation of combined partial counties for the recommended Columbia nonattainment area is appropriate. There are three monitors in Richland County, two of which are captured within the boundary. One of these monitors currently indicates nonattainment of the 8-hour ozone standard. The other has only two years of data. The third monitor indicates attainment with the standard and is not included in the recommended boundary. Also, between 2000 and 2002, the Department operated an ozone monitor in Eastern Aiken County (West of Columbia) to assess conditions between Aiken and Columbia, South Carolina. This monitor was located approximately 20 miles from the Lexington County line. This monitor indicated attainment of the ozone standard and further supports the recommendation of the proposed boundary. The three monitors in Richland County only accounted for two exceedances of the ozone standard value (0.085 ppm or higher) in 2003. By designating all of Richland and Lexington Counties as nonattainment, the citizens would be told that their air quality does not meet the standard when the monitoring data confirms that it does.

Based on the point source emissions captured in the area and recommended controls on those outside, designation of combined partial counties for the recommended Columbia nonattainment area is appropriate. The Lexington County portion of the recommended Columbia nonattainment area accounts for 99.7 percent of the NO_x point source emissions and 97.9 percent of the VOC point source emissions, respectively. The Richland County portion of the recommended Columbia nonattainment area accounts for 2.0 percent of the NO_x point source emissions and 84.9 percent of the VOC point source emissions, respectively (See figures 3 - 6).

There are two significant nitrogen oxides (NO_x) sources in Richland County, SCE&G: Wateree and International Paper: Eastover, which are outside of the proposed boundary. SCE&G: Wateree has installed Selective Catalytic Reduction (SCR) emission control devices to significantly reduce their NO_s emissions from 38.4 tons per day to 12.94 tons per day, resulting in a 66% daily reduction, during the ozone season. International Paper: Eastover, the second largest NO_x source in Richland County, is subject to the State's federally approved NO_x SIP Call Plan. The Department has the necessary authority to require additional controls, if further reductions are appropriate, to attain the National Ambient Air Quality Standards (NAAQS) in the recommended Columbia nonattainment area. The Richland County ozone monitoring station (Congaree Bluff 45-079-0021) is located in a rural area between International Paper: Eastover and the recommended Columbia nonattainment area. The monitor is not within the recommended Columbia nonattainment area. The Congaree Bluff ozone monitor indicates attainment of the NAAQS.

Figure 3: Lexington County Point Source NO_x Emissions

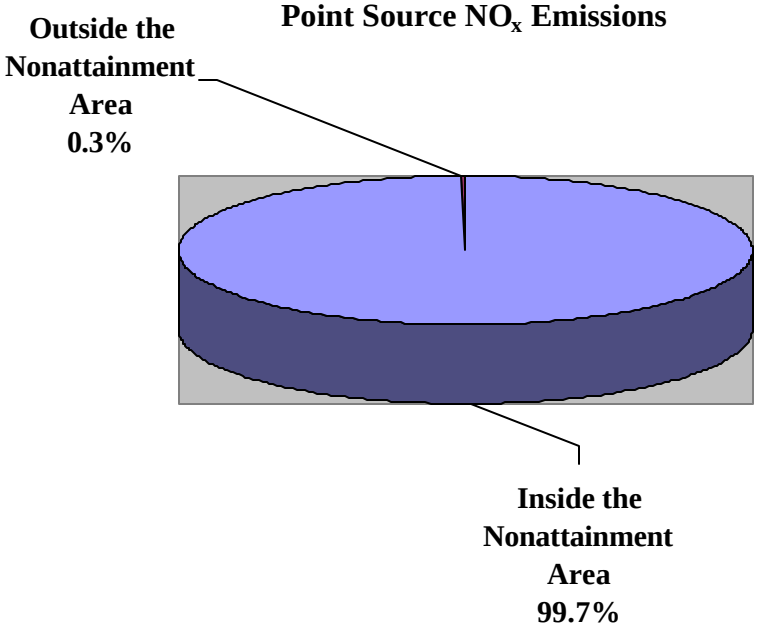


Figure 4: Lexington County Point Source VOC Emissions

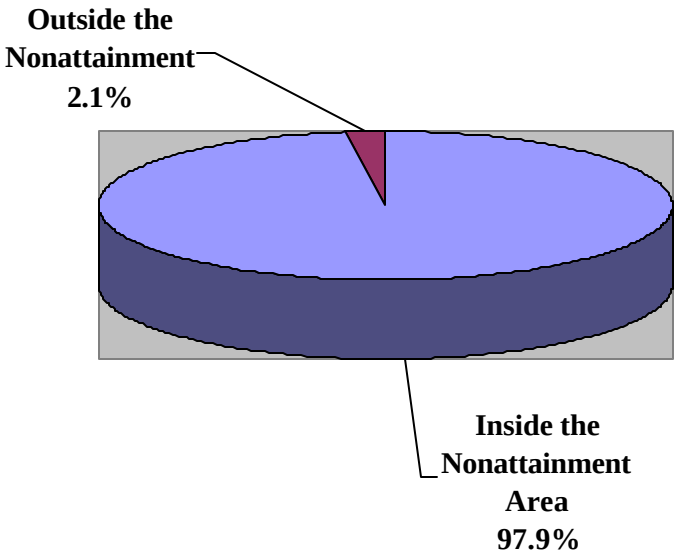


Figure 5: Richland County
Point Source NO_x Emissions

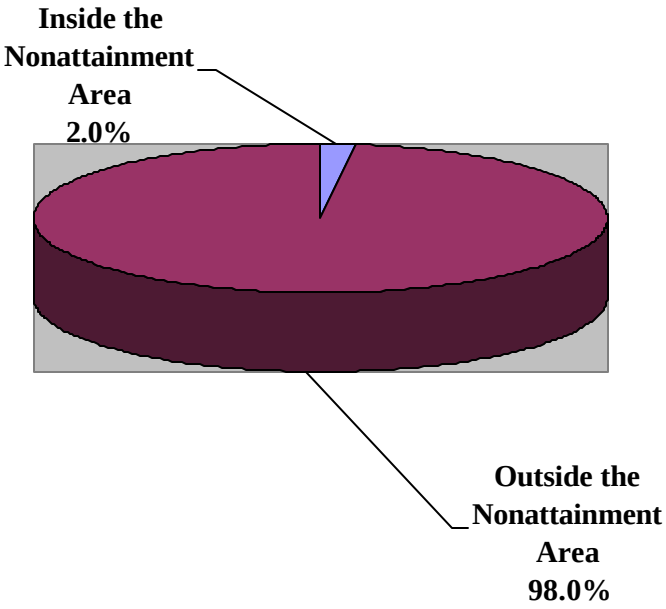
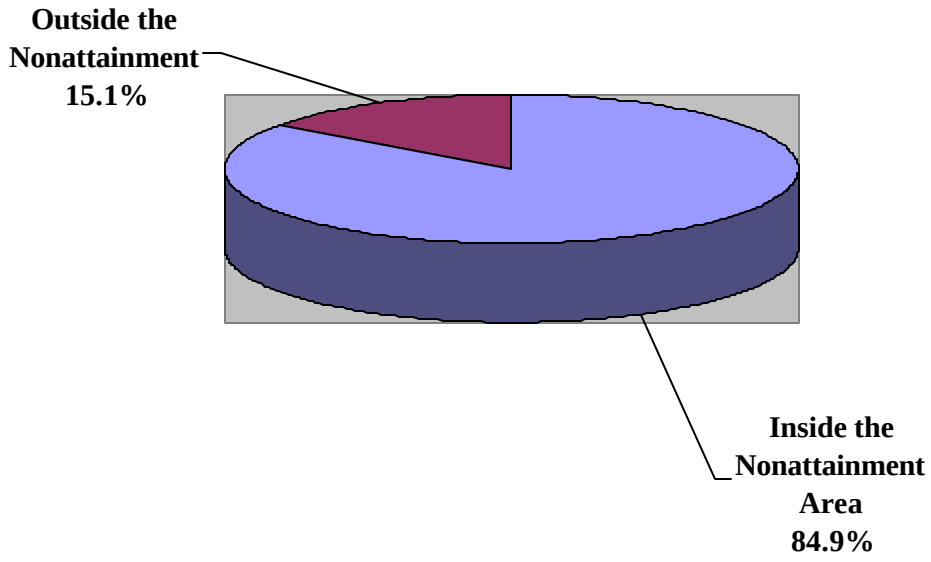


Figure 6: Richland County
Point Source VOC Emissions



Based on the high Daily Vehicle Miles Traveled (DVMT) captured in the recommended area, designation of combined partial counties for the recommended Columbia nonattainment area is appropriate. The proposed boundary captures 91% of the daily vehicle miles traveled in the two counties and it is estimated that in 2025 the boundary will capture 93%.

Based on commuter flow, designation of combined partial counties for the recommended Columbia nonattainment area is appropriate. According to the U.S. Census Bureau 71.68 percent of workers in the Columbia MSA, work in the same county they live in. Lexington County accounts for 41.10 percent of the working population in the MSA, workers living in Lexington and commuting to other counties in the State account for only 17.61 percent of the entire worker flow. Richland County accounts for 58.89 percent of the working population in the MSA, workers living in Richland and commuting to other counties in the State account for only 7.51 percent of the entire worker flow.

Table 1:
County of Residence for the Columbia MSA

County Worked In	Lexington	Richland	Grand Total
Lexington	23.49%	7.51%	31.00%
Richland	17.61%	51.38%	69.00%
Grand Total	41.10%	58.89%	100.00%
Out of County Flow	17.61%	7.51%	

Based on South Carolina's commitment to "Cleaner Air Sooner," designation of combined partial counties for the recommended Columbia nonattainment area is appropriate. The South Carolina General Assembly passed, and our Governor signed, a concurrent resolution that endorses Early Action Compacts and encourages state agencies to develop programs that focus on efforts that state government can take to reduce ground-level ozone. At the end of 2002, 45 of South Carolina's 46 counties entered into Early Action Compacts to implement ozone reduction strategies earlier than federally required. These counties, along with other government entities, industry, environmental groups, and other stakeholders have worked together both at the local level and state level to develop strategies to reduce ozone pollution. The few counties that have been identified by EPA as potential nonattainment areas are actively participating in the Early Action Compact process and are developing local plans to bring cleaner air sooner to their citizens. Most importantly to our future air quality, the 45 counties continue to embrace strategies that are best for improving air quality on a statewide level and not just where boundary lines are proposed to be drawn. These efforts demonstrate a commitment by all involved to protect and improve air quality for the citizens of South Carolina.

Based on South Carolina's statutory authority to require controls on sources regardless of location, designation of combined partial counties for the recommended Columbia nonattainment area is appropriate. The Department has the legal authority to seek emission reductions from any source regardless of where it is located if it adversely impacts air quality. The Department currently has regulations that are more stringent and protective than federal requirements. Further, our recent actions such as addressing NO_x emissions from stationary sources demonstrate our ability and political will to implement controls to improve air quality statewide rather than on an area or county level basis.

Based on state and EPA modeling, designation of combined partial counties for the recommended Columbia nonattainment area is appropriate. Preliminary results show that all areas of South Carolina will attain the 8-hour ozone standard by 2007 with the reductions attributed to the NO_x SIP Call and the Tier 2/Low Sulfur Fuel regulations. Additionally, a modeling analysis for the year 2012 demonstrates attainment. The results of this modeling verify the regional modeling completed by EPA, which also demonstrated attainment for all South Carolina areas with implementation of the above programs.

Based on a comprehensive ozone-forecasting program that covers twenty-nine (29) counties in our state, including Richland and Lexington Counties, designation of combined partial counties for the recommended Columbia nonattainment area is appropriate. South Carolina's citizens are alerted on a daily basis during ozone forecasting season as to the predicted quality of the air so that they may take actions as they believe appropriate to better protect their health. The Department has expended and will continue to expend significant resources to provide this service to our citizens. This daily forecast is a much better indication to the public of when they need to act to avoid exposure to high ozone levels than a nonattainment designation, which is a one-time publication in the *Federal Register*.

Based on the unique transportation and air quality planning programs, designation of combined partial counties for the recommended Columbia nonattainment area is appropriate The Columbia Area Transportation Study (COATS) performs transportation planning specific for the urbanized portions of Lexington and Richland Counties. Similarly, the Department has a regional environmental office located in Richland County that monitors compliance of the regulated sources within Lexington, Richland, Newberry, and Fairfield Counties.

Conclusion

The thirteen factors listed below represent the most compelling reasons why the Department believes designating only **combined portions** of Lexington and Richland Counties as the nonattainment boundary for the Columbia area is appropriate. Additional data to support these factors, as well as other supporting documentation to address EPA's eleven criteria is attached.

1. EPA presumptive boundary sizes.
2. Clean Air Act allows for area.
3. Low population and low population density in none recommended areas.
4. Low percentage of employees in the recommended area.
5. Quality assured ozone-monitoring data.
6. Point source emissions in recommended area.
7. High amount of DVMT in recommended area.
8. Low MSA commuter flow.
9. Legislative and County support for the Department's "Cleaner Air Sooner" concept.
10. The Department's statutory authority to require controls on sources regardless of location.
11. State and EPA modeling indicating attainment with the ozone standard in 2007 and 2012.
12. Comprehensive Ozone Forecasting Program.
13. Unique transportation and air quality planning programs.

Supporting Documentation for
Columbia Nonattainment Area
Boundary Recommendation

Throughout the rest of this summary of the recommended Columbia nonattainment area recommendation, any statistical analysis or evaluation of data will be conducted in comparison to the EPA's presumptive nonattainment area, which includes Richland and Lexington Counties (Columbia MSA).

Columbia Nonattainment Area
Boundary Recommendation

A. Emissions and Air Quality in Adjacent Areas (Including Adjacent MSAs)

To evaluate the emissions in Lexington and Richland Counties and the adjacent counties, the Department utilized the estimated 1999 oxides of nitrogen (NO_x) and volatile organic compounds (VOC) emissions. The types of NO_x and VOC emission sources that were evaluated include point, area, biogenic, and off-road and on-road mobile sources.

Figures A-1 and A-2 show a comparison of emission levels from each source category for Lexington County, Richland County, and the surrounding South Carolina counties. Additional emissions inventory information is provided in Section D.

Figure A-1: NO_x Sources for Lexington, Richland and Adjacent Counties

*** Order of bars corresponds with order of counties in legend.**

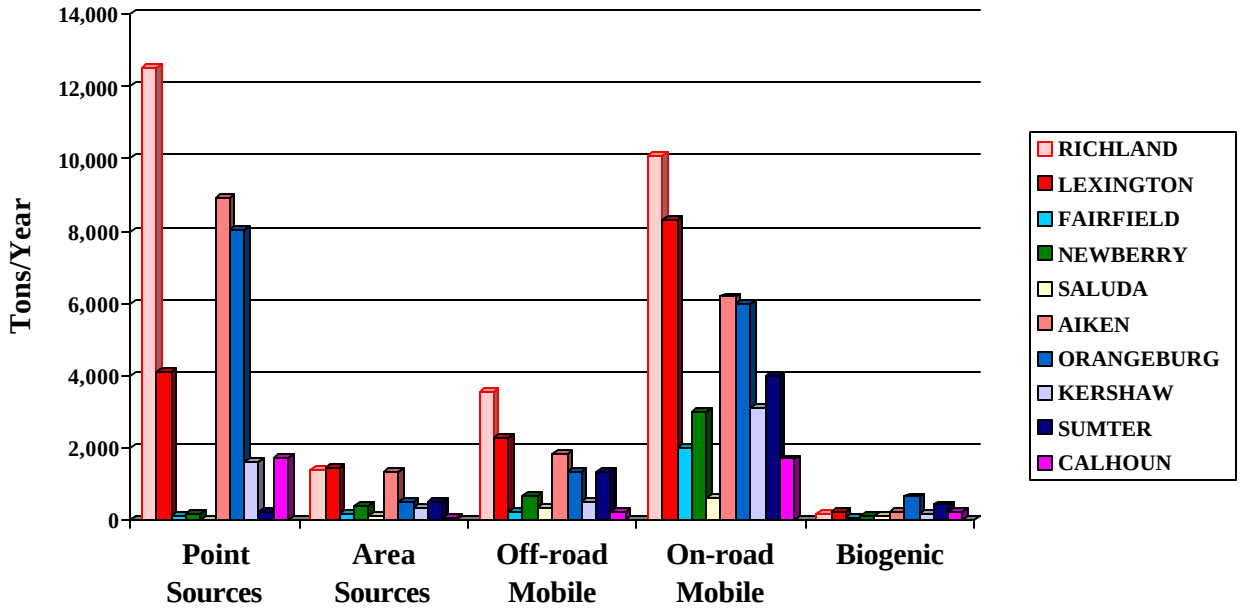
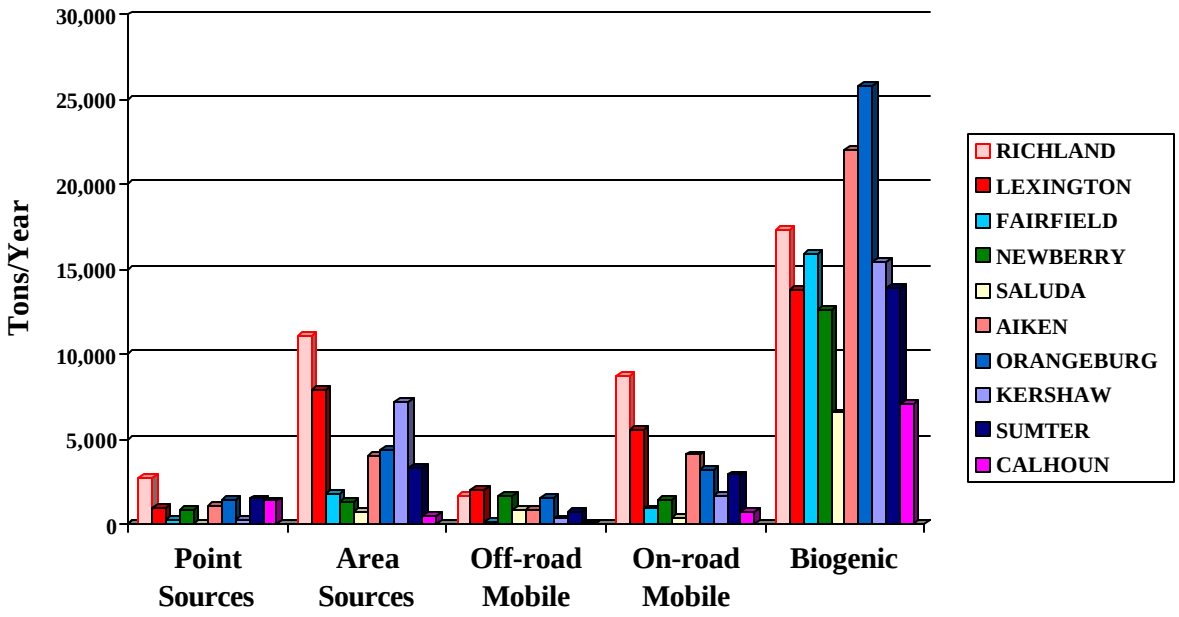


Figure A-2: VOC Sources for Lexington, Richland and Adjacent Countie
*** Order of bars corresponds with order of counties in legend.**



The Department currently has three ozone-monitoring sites in Richland County; two of the monitors indicate attainment of the standard, however, one monitor indicates nonattainment of the air quality standard. Lexington County is bounded to the West by an attaining monitor in Aiken County. Additional air quality information is provided in Section C.

B. Population Density and Degree of Urbanization Including Commercial Development (Significant Difference from Surrounding Areas)

In 2000, the Columbia MSA (Richland County and Lexington County) had a population of 536,691, within a land area encompassing 1,455 square miles, the population density of the entire MSA was 368.86 persons per square mile. The recommended Columbia nonattainment area boundary captures 92.14% of the population, or 494,518 people, within a land area encompassing 995.8 square miles. The recommended nonattainment area has a population density of 496.6 persons per square mile. The portions of Richland and Lexington Counties not captured within the boundary are rural in nature, with a population density of only 91.84 persons per square mile.

Moreover, Figure B-1 shows that the recommended area contains all but the least populated areas in Richland and Lexington Counties.

Figure B-1

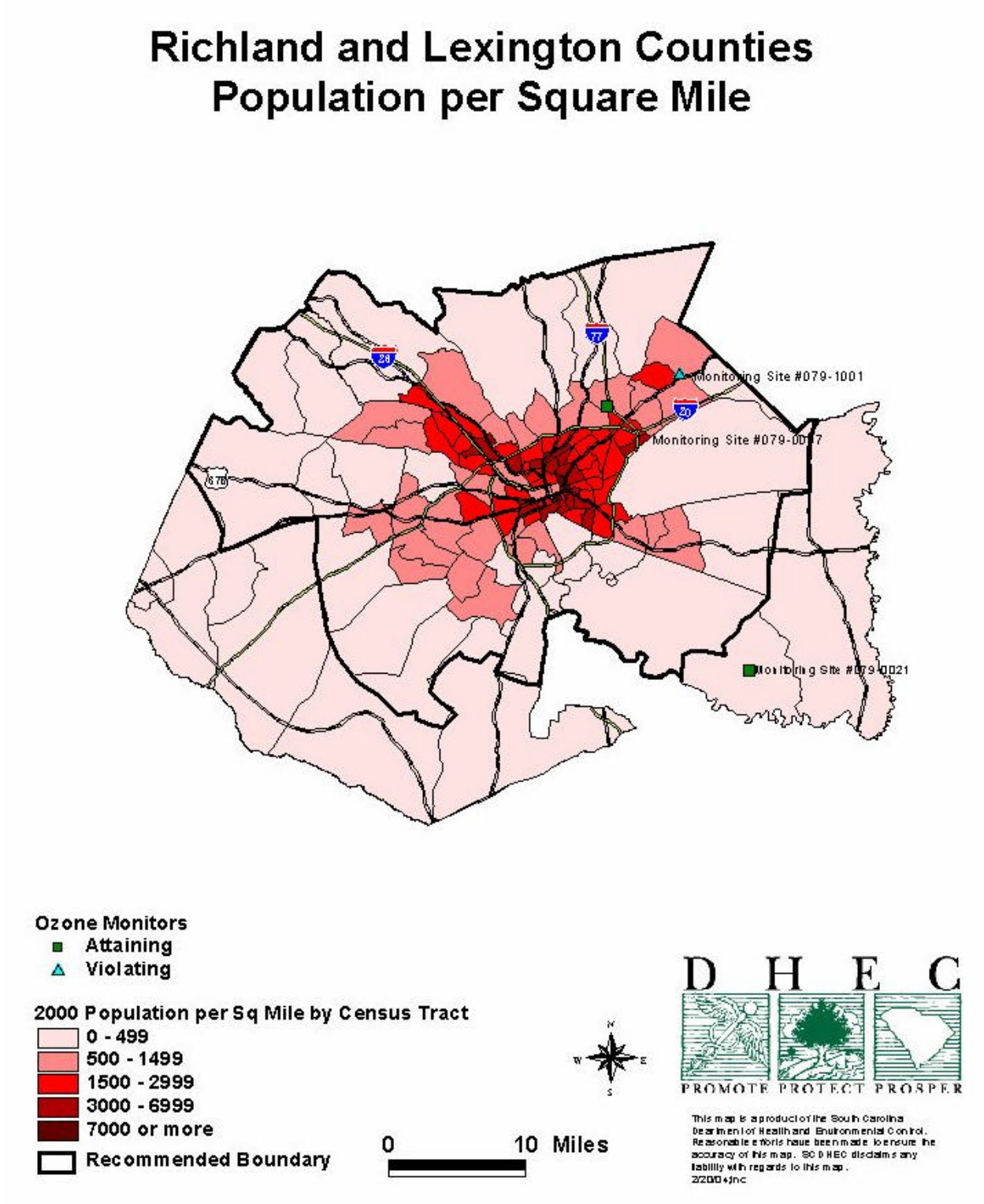

Richland and Lexington Counties
Population per Square Mile
Monitoring Site #079-1001
Monitoring Site #079-0017
Monitoring Site #079-0021
Ozone Monitors
Attaining
Violating
2000 Population per Sq Mile by Census Tract
0 - 499
500 - 1499
1500 - 2999
3000 - 6999
7000 or more
Recommended Boundary
0
10 Miles
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Figure B-2 shows the urban areas for the Columbia MSA. Approximately 17.98% of the MSA land area encompasses 99% of the urban population, which is captured with in the recommended area.

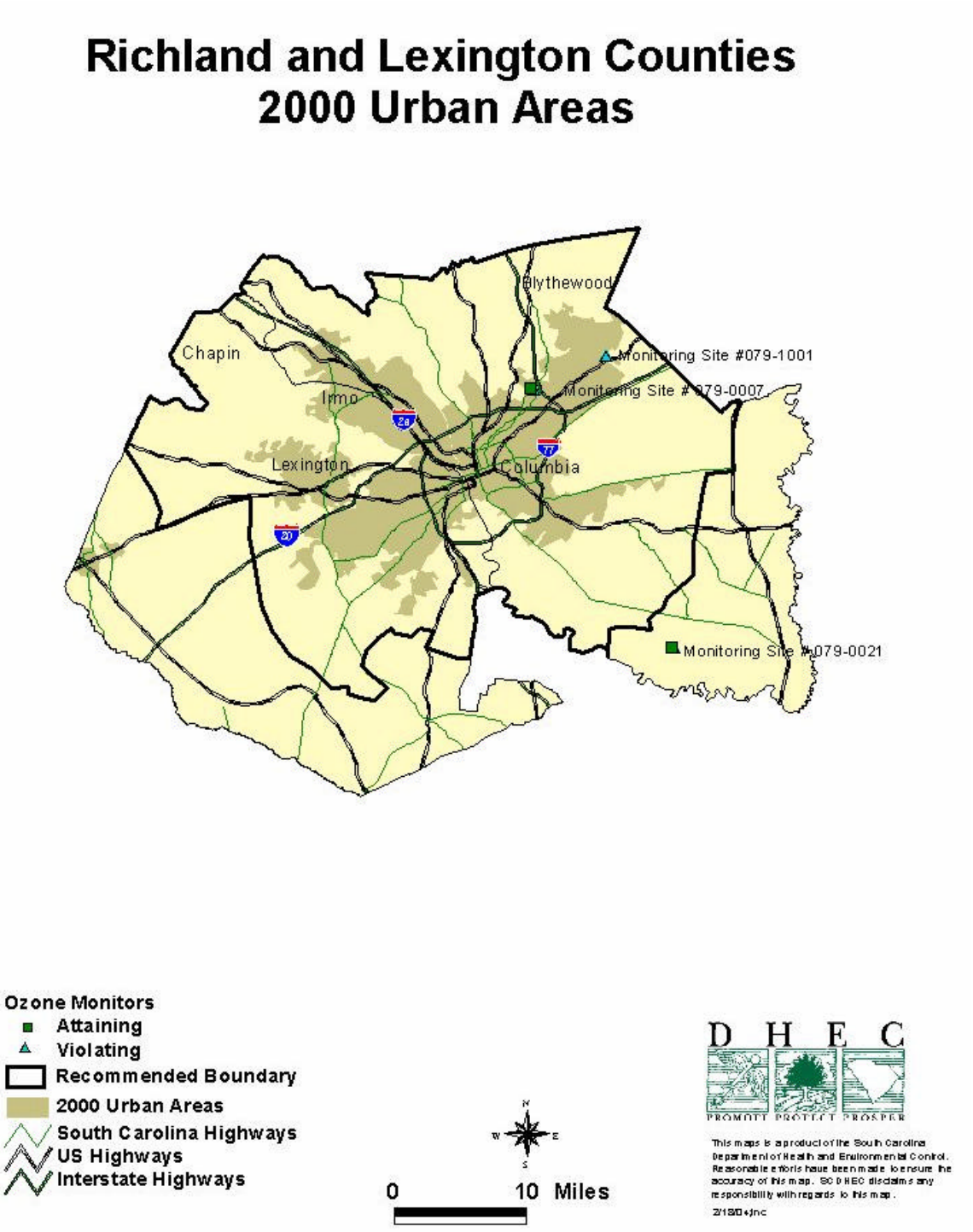
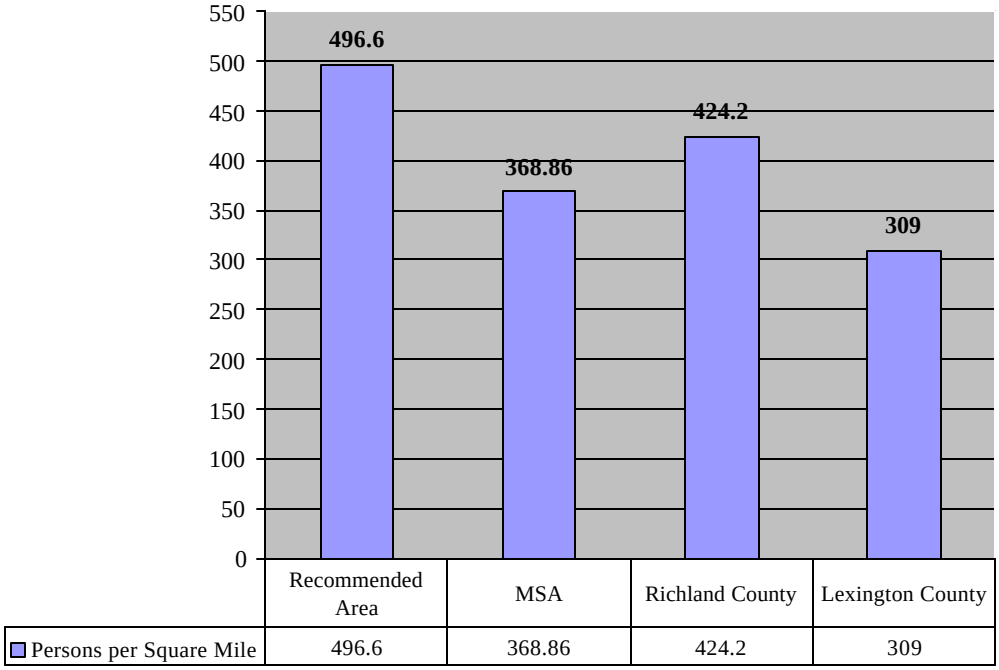


Table B-1 compares the population and land area data for the Columbia MSA to the recommended area.

Table B-1: Population, Land Area, and Urban/Rural Population, 2000						
	MSA	**Richland County**	**Lexington County**	**Recommended Area**	**Richland County Portion**	**Lexington County Portion**
Population[1]	536,691	320,677	216,014	494,518	313,253	181,265
Land Area (Square Miles)[1]	1455	756	699	995.8	581.2	414.6
Persons per Square Mile[1]	368.86	424.2	309.0	496.6	539.0	437.2
Urban Population[2]	422,689	279,512	143,177			
% Urban Population[2]	78.79%	87.2%	66.3%	99[3]%	100%	98%
Rural Population[2]	114,002	41,165	72,837			
% Rural Population[2]	21.21%	12.8%	33.7%			

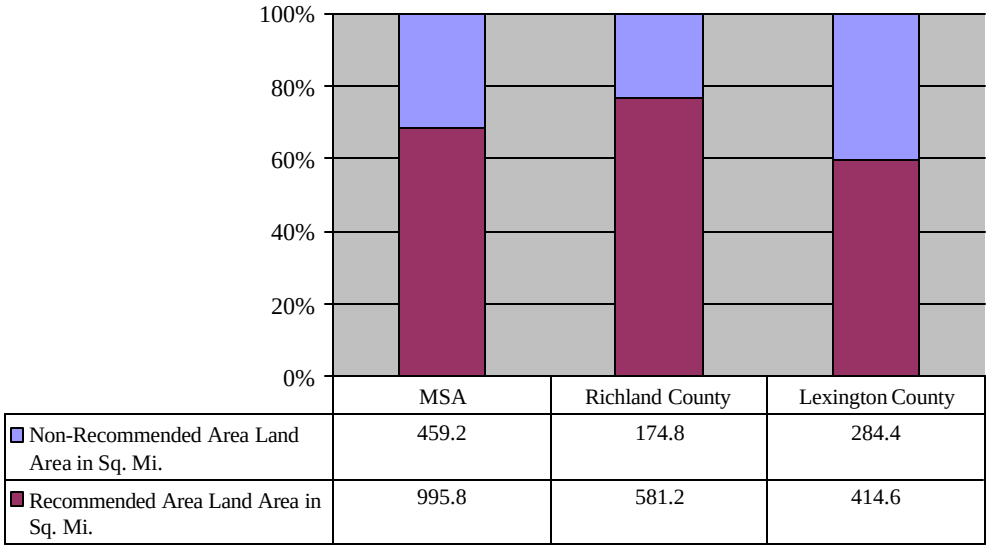
Figures B-3 and B-4 show the population density distribution, and land area distribution, respectively, for Lexington and Richland Counties relative to the recommended Columbia nonattainment area.

Figure B-3: Population Density, 2000
(Persons per Square Mile)



[1] Data provided by the US Census: 2000. Data for the recommended area was obtained from the SCDOT.
[2] Data provided by the SC Office of Research and Statistics.
[3] Estimated.

Figure B-4: Land Area Distribution according to Recommended Area Boundary, 2000



	MSA	Richland County	Lexington County
Non-Recommended Area Land Area in Sq. Mi.	459.2	174.8	284.4
Recommended Area Land Area in Sq. Mi.	995.8	581.2	414.6

The recommended Columbia nonattainment area contains a large majority of the economic development in Lexington and Richland Counties as seen in Tables B-2 through B-4. It is estimated that Richland and Lexington Counties have over 98% and 86% of its manufacturing establishments located inside the recommended area boundary, respectively. About 29,322 people work in manufacturing in the two-county area, and 26,696 of those people, or about 91.04%, work inside the recommended area boundary. The concentrated urban area also supports retail trade. The number of employees working in retail in the counties combined equals 34,192 at some 2,384 retail trade establishments throughout the two counties. It is reasonable to assume that the boundary contains the majority of the retail business, particularly since the metropolitan areas of Lexington and Richland County are captured and those areas assumedly compose an elevated extent of the retail employees and trade.

Table B-2:
Total Number of Manufacturing Employees, 2000[4]

	In Recommended Area Boundary	In County Boundary	Percent in Recommended Area Boundary
Lexington	10,817	12,587	85.94%
Richland	15,879	16,735	94.88%
Total	**26,696**	**29,322**	**91.04%**

[4] Data from Bureau of Air Quality "SC Company File1.xls," based on 2001.

Table B-3: Total Number of Manufacturing Establishments, 2000 [3]			
	In Recommended Area Boundary	**In County Boundary**	**Percent in Recommended Area Boundary**
Lexington	154	179	86.03%
Richland	205	209	98.09%
Total	**359**	**388**	**92.53%**

Table B-4: Retail Trade Patterns, 2000[5]		
	Number of Employees	**Number of Establishments**
Lexington County	11,354	843
Richland County	22,838	1,541
Total	**34,192**	**2,384**

Tables B-5 and B-6 show both the number of employees and establishments for Richland and Lexington Counties according to the Census 2000 North American Industry Classification System (NAICS) database and are ranked in order according to the number of employees. The largest employment sector in Richland County is Health Care and Social Assistance.[6] The second largest is Administration, Support, Waste Management, Remediation Services, and the third is Retail Trade. The largest employment sector in Lexington County is Retail Trade.[7] The second largest is Manufacturing, and the third is Accommodation and Food Services.

Table B-5: Employees per Classification (Richland County) NAICS, 2001				
County	**Industry Code Description**	**Number of Employees**	**Total Establishments**	**Rank Based on Number of Employees from greatest to least**
Richland	Health Care & Social Assistance	24807	945	1
Richland	Administration, Support, Waste Management, & Remediation Services	23867	494	2
Richland	Retail Trade	22920	1583	3
Richland	Finance & Insurance	18573	795	4
Richland	Accommodation & Food Services	15482	714	5
Richland	Professional, Scientific & Technical Services	15171	1127	6
Richland	Manufacturing	14192	261	7

[5] Data provided by US Census: 2000.
[6] Data provided by US Census: 2000.
[7] Data provided by US Census: 2000.

Table B-5: Employees per Classification (Richland County) NAICS, 2001				
County	**Industry Code Description**	**Number of Employees**	**Total Establishments**	**Rank Based on Number of Employees from greatest to least**
Richland	Other Services (Except Public Administration)	8468	1033	8
Richland	Construction	8072	628	9
Richland	Wholesale Trade	7615	555	10
Richland	Transportation & Warehousing	6078	119	11
Richland	Educational Services	4588	110	12
Richland	Information	4322	147	13
Richland	Real Estate & Rental & Leasing	2793	412	14
Richland	Management Of Companies & Enterprises	2251	62	15
Richland	Arts, Entertainment & Recreation	1613	102	16
Richland	Auxiliaries (Exc Corporate, Subsidiary & Regional Mgt)	480	23	17
Richland	Forestry, Fishing, Hunting, & Agriculture Support	106	20	18
Richland	Unclassified Establishments	20-99	95	*
Richland	Mining	100-249	5	*
Richland	Utilities	1000-2499	35	*
** The number of employees not available or the number of employees was reported as a range.*				

Table B-6: Employees per Classification (Lexington County) NAICS, 2001				
County	**Industry Code Description**	**Number of Employees**	**Total Establishments**	**Rank Based on Number of Employees from greatest to least**
Lexington	Retail Trade	11,107	841	1
Lexington	Manufacturing	9,240	224	2
Lexington	Accommodation & Food Services	7,540	330	3
Lexington	Health Care & Social Assistance	6,970	340	4
Lexington	Construction	6,134	790	5
Lexington	Wholesale Trade	5,234	315	6
Lexington	Admin, Support, Waste Mgt, Remediation Services	5,046	271	7
Lexington	Other Services (Except Public Administration)	4,322	583	8
Lexington	Transportation & Warehousing	2,870	156	9
Lexington	Finance & Insurance	2,362	277	10

Table B-6: Employees per Classification (Lexington County) NAICS, 2001				
County	**Industry Code Description**	**Number of Employees**	**Total Establishments**	**Rank Based on Number of Employees from greatest to least**
Lexington	Professional, Scientific & Technical Services	2,279	388	11
Lexington	Real Estate & Rental & Leasing	1,140	166	12
Lexington	Management Of Companies & Enterprises	1,069	29	13
Lexington	Information	660	48	14
Lexington	Arts, Entertainment & Recreation	502	61	15
Lexington	Utilities	430	20	16
Lexington	Educational Services	230	38	17
Lexington	Mining	163	6	18
Lexington	Auxiliaries (Except Corporate, Subsidiary & Regional Mgt)	97	9	19
Lexington	Unclassified Establishments	87	47	20
Lexington	Forestry, Fishing, Hunting, & Agriculture Support	78	13	21
** The number of employees not available or the number of employees was reported as a range.*				

The data in Tables B-7 and B-8 was taken from the Census 2000 and is based on the NAICS Industry Code Description for the year 2001. Table B-7 contains the number of employees and establishments for both Richland and Lexington Counties. The table also shows the percentage of employees and establishments each county contributes as a part of the MSA. Given that the vast majority of the manufacturing and retail trade establishments and employees in the Columbia MSA are located in the recommended area (Tables B-2 through B-4) and that the MSA, particularly the recommended area, is predominantly urban, it is reasonably assumed that the majority of the employees and establishments in the county for each industry code category are contained within the recommended area boundary.

Table B-7: Number of Employees and Establishments per County					
Area	**Total Employees**	**% Employees**	**Total Establishments**	**% Establishments**	**% Land Area Captured by Recommended Area**
Lexington	67,560	27.14%	4,952	34.83%	59.31%
Richland	181,398	72.86%	9,265	65.17%	76.88%
MSA	248,958		14,217		

Table B-8 contains the number of MSA employees per classification for 2001, based on the NAICS Industry Code Description. For example, the Accommodation & Food Services classification in 2001 accounted for 9.17% of the employees in the MSA, and 67.25% of those employees worked in Richland

County while 32.75% of those employees worked in Lexington County. The largest employment in the MSA is in Retail Trade (13.56%), of that classification Richland County employed 67.36% and Lexington County employed 32.64%. The second largest employment in the MSA is in Health Care & Social Assistance (12.66%), of that classification, Richland County employed 78.07% and Lexington County employed 21.93%. Manufacturing, the fourth largest employment classification, employed 9.34% of the MSA employees, and 60.57% were employed in Richland County while 39.43% were employed in Lexington County. In fact, in 2001 Richland County comprised the majority of employees in all but four industry code categories as seen in Table B-8.

Table B-8:
MSA Employees per Classification, NAICS, 2001

Industry Code Description	% in MSA	Richland County	Lexington County
Accommodation & food services	9.17%	67.25%	32.75%
Admin, support, waste mgt, remediation services	11.52%	82.55%	17.45%
Arts, entertainment & recreation	0.84%	76.26%	31.12%
Auxiliaries (except corporate, subsidiary & regional mgt)	0.23%	83.19%	16.81%
Construction	5.66%	56.82%	43.18%
Educational services	1.92%	95.23%	5.01%
Finance & insurance	8.34%	88.72%	12.72%
Forestry, fishing, hunting, and agriculture support	0.07%	57.61%	73.58%
Health care and social assistance	12.66%	78.07%	21.93%
Information	1.99%	86.75%	13.25%
Management of companies & enterprises	1.32%	67.80%	32.20%
Manufacturing	9.34%	60.57%	39.43%
Mining	0.06%	*	100.00%
Other services (except public administration)	5.10%	66.21%	33.79%
Professional, scientific & technical services	6.95%	86.94%	13.06%
Real estate & rental & leasing	1.57%	71.01%	28.99%
Retail trade	13.56%	67.36%	32.64%
Transportation & warehousing	3.57%	67.93%	32.07%
Unclassified establishments	0.03%	*	100.00%
Utilities	0.17%	*	100.00%
Wholesale trade	5.12%	59.27%	40.73%

** The number of employees not available or the number of employees was reported as a range.*

Again, given that the vast majority of the manufacturing and retail trade establishments and employees in the Columbia MSA are located in the recommended area (Tables B-2 through B-4) and that the MSA, particularly the recommended area, is predominantly urban, it is reasonably assumed that the majority of the employees and establishments in the counties for each industry code category are contained within the recommended area boundary.

C. Monitoring Data Representing Ozone Concentrations in Local Areas and Larger Areas (urban or regional scale)

There are currently three ozone monitors in Richland County. Data from all three of the monitors and

a nearby monitor in Aiken County were used for this boundary determination. Lexington County does not have an ozone monitoring station.

The first Richland County ozone monitoring station (Parklane 45-079-0007) is located within the recommended Columbia nonattainment area. It is in a suburban area across a four-lane street from residential zoning. The site was established in 1980 and is approximately 110 meters above sea level. It is near to State Park Health Center and located in a field between Parklane Road and Counts Road, behind the SC Archives and History complex. The surrounding area has business parks, small businesses, housing, and apartment complexes. Parklane Road is heavily congested during business hours. This is due to its proximity of the intersections with Farrow Road (SC 555), Two Notch Road (US 1), and the SC-277 / I-77 interchange. The monitoring objective for Parklane site is to measure maximum ozone concentrations.

The second Richland County ozone monitoring station (Congaree Bluff 45-079-0021) has replaced the Congaree Swamp (45-079-1006) station. Congaree Bluff is located in a rural area off of South Cedar Creek Road within the Congaree Swamp National Monument. The Congaree Swamp National Monument is located within the Cedar Creek flood plain. The area surrounding the monitoring station is forest, and is approximately 100 meters within the Congaree Swamp National Monument boundary. This monitoring site is approximately 34 meters above sea level and has been relocated to this less frequently flooded area to ensure reliable access to the site. The monitoring objective for Congaree Bluff site is to measure ozone concentrations for general background. The monitor is not within the recommended Columbia nonattainment area.

The third Richland County ozone monitoring station (Sandhill #2 45-079-1002) was located within the recommended Columbia nonattainment area. It was in a rural setting on agricultural land. In early 2002, Sandhill #2 was replaced with the Sandhill Experiment Station (45-079-1001) air monitor. It was moved approximately 715 meters from the old site and it is 134 meters above sea level. The surrounding area was recently developed for residential use with elementary and middle schools built within the community. The main roads that lead to the site are US 1 and Clemson Road. The area has recently become rather populated and Clemson Road has expanded from a two-lane road to a four-lane road. An overpass over US 1 was constructed to gain easier access to US 1 and I-20. The monitoring objective for Sandhill Experiment Station is to measure ozone concentrations for upwind background. EPA considers the ozone data recorded at both locations to be a continuous calculation of ozone levels in that area, thus they calculated the 2003 design value, using the 2001 value from Sandhill #2 with the 2002-2003 values from the Sandhill Experiment Station.

The Aiken County ozone monitoring station (Jackson Middle School 45-003-0003) is located off Highway 125, approximately 91 meters above sea level. The surrounding area of the monitoring site is residential. According to SCDOT, traffic counts for 1993 show 3,000 vehicles per day accessed the road. The site has been is operation since 1985 and measurement of ozone concentration runs mid-March through mid-November. The monitoring objective for this site is to measure ozone concentrations for source oriented emissions.

The Aiken County ozone monitoring station (Wagener DOT 45-003-0004) was a short-term special study monitor to determine the gradient difference between Richland and Aiken Counties. The Wagener DOT ozone monitoring site was located in Northern Aiken County approximately 20 miles from the Lexington County line. The monitor was established in August 2000 and ran until November 2002. It was surrounded by agricultural land and sat approximately 138 meters above sea level. The monitoring objective for this site was to measure ozone concentrations for general/background. The monitor was attaining the 8-hour ozone standard and justifies the Department's recommendation of designating partial Lexington County.

Table C-1 presents the 2001 through 2003 8-hour ozone monitoring data for Richland and Aiken Counties. The design value is the annual fourth-highest daily maximum 8-hour ozone concentration, expressed in parts per million (ppm), averaged over three consecutive years. The 2003 design values for the Parklane, Congaree Bluff, and Jackson Middle School monitors indicate attainment with the 8-hour ozone standard.

Table C-1:
Columbia Nonattainment Area Ozone Monitoring Data

County	Site ID	Site Name	4th Maximum 8-Hour			Design Value
			2001	2002	2003	
Richland	45-079-0007	Parklane - State Park Health Ctr	0.082	0.084	0.075	0.080
Richland	45-079-0021	Congaree Bluff	0.076	0.082	0.074	0.077
Richland	45-079-1002	Sandhill #2 (relocated in 2002)	0.091			.089
Richland	45-079-1001	Sandhills Experiment Station		0.093	0.083	
Aiken	45-003-0003	Jackson Middle School	0.081	0.092	0.069	0.080
Aiken	45-003-0004	Wagener DOT (removed in 2003)	0.079	0.089		N/A

Table C-2 contains the previous three years daily maximum ozone concentrations above 0.084 ppm for Parklane, Congaree Bluff, Sandhills Experimental Station, Sandhill #2, Jackson Middle School, and Wagener DOT. A period indicates that no exceedance occurred on the same day at that location.

Table C-2:
2001-2003 Daily Maximum 8-hour Average ppm for York and Surrounding Monitors

Date of Exceedance	Parklane Exceeding Value	Congaree Bluff Exceeding Value	Sandhills Experimental Station Exceeding Value	Sandhill #2 Exceeding Value	Jackson Middle School Exceeding Value	Wagener DOT Exceeding Value
05/01/2001	.	.	.	0.087	.	.
05/05/2001	.	.	.	0.093	.	.
05/06/2001	.	.	.	0.092	.	.
05/16/2001	0.086	0.092	.	0.089	.	.
05/17/2001	.	.	.	.	.	0.089
05/31/2001	.	.	.	.	0.104	0.085
07/17/2001	0.009	.	.	0.091	.	.
07/19/2001	.	.	.	.	0.091	.
08/23/2001	0.091	.	.	0.097	.	.
09/18/2001	.	.	.	0.085	.	.
2001 Total Hits	**3**	**1**	**0**	**7**	**2**	**2**
05/25/2002	.	.	0.089	.	.	
06/03/2002	.	.	0.094	.	.	0.089

Table C-2: 2001-2003 Daily Maximum 8-hour Average ppm for York and Surrounding Monitors						
Date of Exceedance	**Parklane Exceeding Value**	**Congaree Bluff Exceeding Value**	**Sandhills Experimental Station Exceeding Value**	**Sandhill #2 Exceeding Value**	**Jackson Middle School Exceeding Value**	**Wagener DOT Exceeding Value**
06/04/2002	.	.	0.086	.	.	
06/10/2002	.	.	0.088	.	.	0.089
06/11/2002	0.087	.	0.094	.	.	0.089
06/12/2002	.	.	0.088	.	.	
06/13/2002	0.093	.	0.104	.	0.095	0.099
07/02/2002	.	.	0.089	.	.	
07/03/2002	.	.	0.092	.	.	
07/04/2002	.	.	0.090	.	.	
07/05/2002	.	0.087	0.089	.	0.093	
07/06/2002	.	.	0.085	.	.	
07/08/2002	.	.	0.089	.	.	0.085
07/16/2002	.	.	0.085	.	.	
07/17/2002	.	0.094	0.093	.	0.093	0.091
07/18/2002	.	.	0.090	.	.	
08/02/2002	.	.	0.087	.	.	
09/11/2002	0.086	0.086	.	.	0.092	0.092
2002 Total Hits	**3**	**3**	**17**	**0**	**4**	**7**
04/13/2003	.	.	0.089	.	.	.
06/25/2003	0.093	.	.	.	.	.
2003 Total Hits	**1**	**0**	**1**	**0**	**0**	**0**

Figure C-1 shows the back trajectories for 2001-2003 on high ozone days (greater than or equal to 0.085 ppm) for the Sandhill monitor. The majority of the winds on these days came from either the North or South. Very few of the back trajectories pass through the portion of Lexington County that is not included in the recommended Columbia nonattainment area.

Figure C-1:

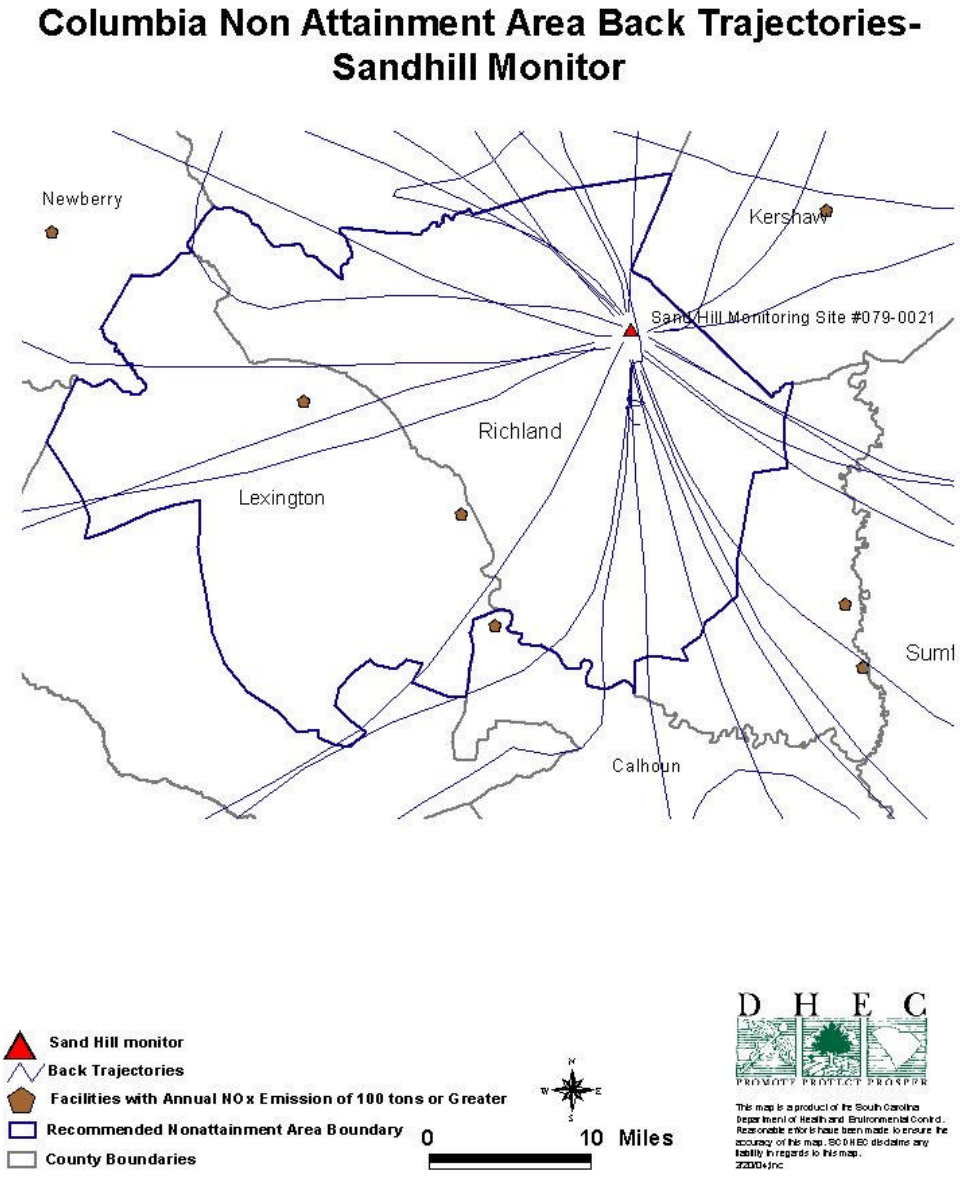

Columbia Non Attainment Area Back Trajectories-
Sandhill Monitor
Newberry
Kershaw
Sand Hill Monitoring Site #079-0021
Richland
Lexington
Sumt
Calhoun
Sand Hill monitor
Back Trajectories
Facilities with Annual NOx Emission of 100 tons or Greater
Recommended Nonattainment Area Boundary
County Boundaries
0
10 Miles
D H E C
PROMOTE PROTECT PROSPER
This map is a product of the South Carolina Department of Health and Environmental Control. Reasonable effort is have been made to ensure the accuracy of this map. SCDHEC disclaims any liability in regards to this map.

Figure C-2 shows the back trajectories for 2001-2003 on high ozone days (greater than or equal to 0.085 ppm) for the Parklane monitor. The majority of the winds on these days came from either the North or West. Very few of the back trajectories pass through the portions of Richland and Lexington Counties that are not included in the recommended Columbia nonattainment area.

Figure C-2:

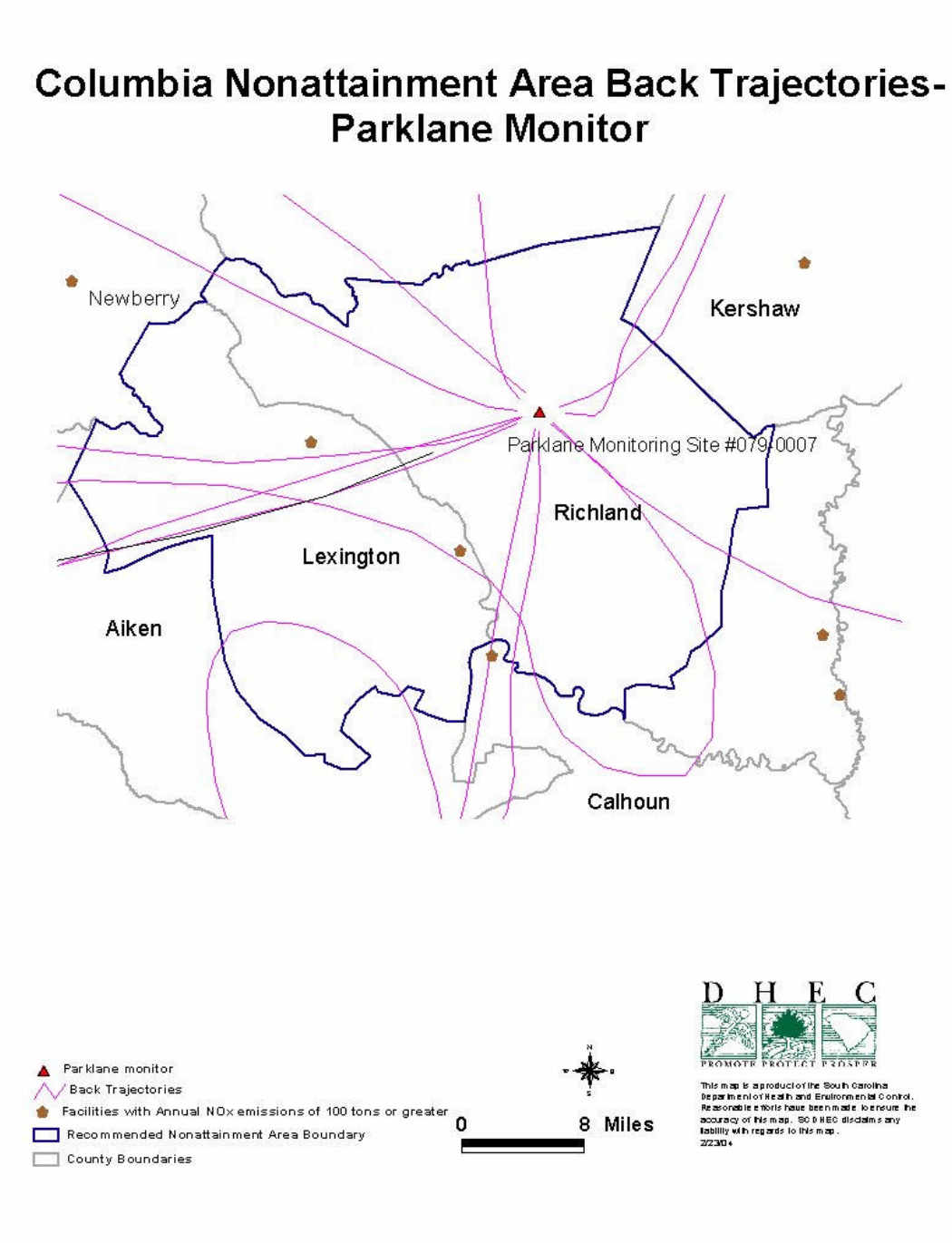
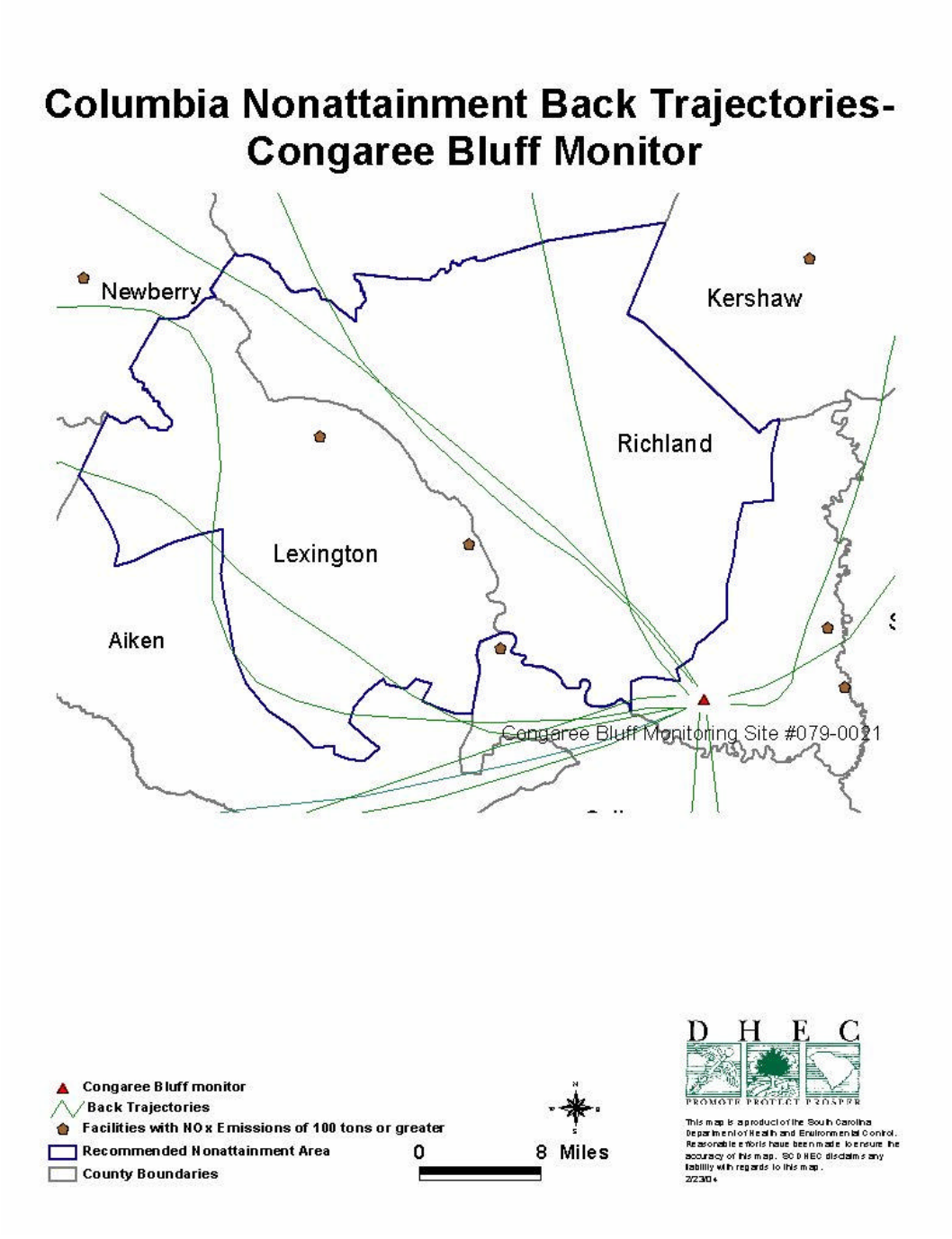


Figure C-3 shows the back trajectories for the four highest ozone values each year between 2001-2003 for the Congaree Bluff monitor. The majority of the winds on these days came from either the North or West. Very few of the back trajectories pass through the portions of Richland and Lexington Counties that are not included in the recommended Columbia nonattainment area.

Figure C-3:



D. Location of Emission Sources

Table D-1 lists the NO_x point sources that are in operation in Lexington and Richland Counties based on the 1999 NO_x point source emissions inventory, which is routinely submitted to the National Emissions Inventory database. Lexington County has 20 NO_x point sources in operation and 17 of these point sources are located within the proposed nonattainment area. Richland County has 32 NO_x point sources in operation and 29 of these point sources are located within the proposed nonattainment area. Facilities in Lexington and Richland Counties that are notated with an asterisk are located outside of the proposed boundary; all other facilities in Lexington and Richland Counties are located within the proposed boundary. Lexington County accounts for 24.44% of the total MSA NO_x point source emissions, while Richland County accounts for 75.53%.

Table D-1:
MSA Point Source NO2 Emissions

County	Plant Name	Permit Number	Pollutant	Point Source-NO2 (Tons / Year)
Lexington	SCE&G:McMeekin	1560-0003	NO2	3,825.87
Lexington	SMI Steel SC	1560-0087	NO2	127.04
Lexington	Honeywell:Columbia	1560-0016	NO2	60.84
Lexington	Michelin:Lexington US5	1560-0042	NO2	44.41
Lexington	Boral Bricks:Lexington	1560-0006	NO2	15.10
Lexington	Lexington Medical Center:West Columbia	1560-0055	NO2	12.93
Lexington	* Martin, JB	1560-0095	NO2	10.89
Lexington	Corley & Sons Sawmill	1560-0068	NO2	7.35
Lexington	BC Components	1560-0054	NO2	6.71
Lexington	Rea Construction:Plant 51	9900-0083	NO2	4.93
Lexington	US Silica	1560-0005	NO2	4.30
Lexington	Fosterdixiana:Quarry	1560-0038	NO2	3.02
Lexington	Sloan Construction:#16	9900-0060	NO2	2.93
Lexington	Columbia Farms:Sunset Blvd	1560-0121	NO2	2.34
Lexington	Safety Kleen:Lexington	1560-0039	NO2	2.19
Lexington	* Lanier Construction:Gaston Asphalt	9900-0035	NO2	1.20
Lexington	TCM Mfg USA Inc	1560-0086	NO2	0.85
Lexington	Columbia Silica Sand	1560-0037	NO2	0.52
Lexington	* Nucor Building Systems	1560-0109	NO2	0.32
Lexington	KMS Inc	1560-0073	NO2	0.30
	1999 Lexington Co. Total			**4,134.04**
	Emissions in Nonattainment Area-Total			**4,121.63**
	Emissions in Nonattainment Area-Percent			**99.7%**
Richland	* SCE&G:Wateree	1900-0013	NO2	10,368.25
Richland	* International Paper:Eastover	1900-0046	NO2	2,123.94
Richland	Richtex Brick:Columbia	1900-0010	NO2	73.95
Richland	USC:Columbia Campus Energy Facility	1900-0143	NO2	33.76
Richland	Central Products Co DBA IPG Group	1900-0033	NO2	29.02

Table D-1: MSA Point Source NO2 Emissions				
County	**Plant Name**	**Permit Number**	**Pollutant**	**Point Source-NO2 (Tons / Year)**
Richland	US Army: Ft Jackson	1900-0016	NO2	22.31
Richland	* Richland Landfill	1900-0148	NO2	13.40
Richland	SC DMH:Bull St	1900-0055	NO2	12.22
Richland	Carolina Ceramics	1900-0007	NO2	10.35
Richland	Palmetto Richland Memorial Hospital	1900-0062	NO2	10.14
Richland	US VA Hospital:Columbia	1900-0023	NO2	9.76
Richland	Consolidated Systems	1900-0040	NO2	9.44
Richland	Sloan Construction:# 7	9900-0055	NO2	8.22
Richland	Rea Construction:Plant 52	9900-0081	NO2	5.44
Richland	SCE&G:Coit	1900-0132	NO2	5.37
Richland	Casco Impregnated Papers	1900-0093	NO2	5.05
Richland	American Italian Pasta Co	1900-0130	NO2	3.90
Richland	Jackson, CR:Asphalt	9900-0036	NO2	3.83
Richland	Shakespeare:Columbia	1900-0036	NO2	2.87
Richland	SC General Services:Energy Facility	1900-0162	NO2	2.36
Richland	SC General Services:Columbia Mills	1900-0161	NO2	1.80
Richland	SC General Services:Haynes	1900-0109	NO2	1.24
Richland	FN Manufacturing	1900-0052	NO2	1.02
Richland	Hueck Foils LLC	1900-0146	NO2	0.61
Richland	Colprovia Asphalt #1	9900-0025	NO2	0.51
Richland	Palmetto Baptist Medical Center:Columbia	1900-0044	NO2	0.51
Richland	SC General Services:Sims/Aycock	1900-0104	NO2	0.43
Richland	Plasti-Line Columbia	1900-0169	NO2	0.33
Richland	American Spiralweld Pipe	1900-0179	NO2	0.14
Richland	Tyler Inc	1900-0133	NO2	0.07
Richland	Circle Environmental:Columbia	1900-0164	NO2	0.05
Richland	SC State Farmers Market	1900-0103	NO2	0.04
	1999 Richland Co. Total			**12,760.33**
	Emissions in Nonattainment Area-Total			**254.74**
	Emissions in Nonattainment Area-Percent			**2.0%**

Table D-2 lists the VOC point sources that are in operation in Richland and Lexington Counties based on the 1999 VOC point source emissions inventory, which is routinely submitted to the National Emissions Inventory database. Lexington County has 26 VOC point sources in operation and 24 of these point sources are located within the proposed nonattainment area. Richland County has 33 VOC point sources in operation and 30 are located within the proposed nonattainment area. Facilities in Lexington and Richland Counties that are notated with an asterisk are located outside of the proposed boundary; all other facilities in Lexington and Richland Counties are located within the proposed boundary. Lexington County accounts for 25.38% of the total MSA VOC point source emissions, while Richland County accounts for 74.61%.

Table D-2: MSA Point Source VOC Emissions				
County	**Plant Name**	**Permit Number**	**Pollutant**	**Point Source-VOC (Tons / Year)**
Lexington	Michelin:Lexington US5	1560-0042	VOC	418.72
Lexington	SMI Joist:Cayce	1560-0116	VOC	163.99
Lexington	Honeywell:Columbia	1560-0016	VOC	93.23
Lexington	Michelin:Lexington US7	1560-0113	VOC	66.71
Lexington	SMI Steel SC	1560-0087	VOC	58.71
Lexington	Kline Iron & Steel:Cayce	1560-0102	VOC	24.67
Lexington	Sea Hunt Boat	1560-0117	VOC	23.66
Lexington	KMS Inc	1560-0073	VOC	21.64
Lexington	* Nucor Building Systems	1560-0109	VOC	20.12
Lexington	SCE&G:McMeekin	1560-0003	VOC	19.48
Lexington	TCM MFG USA Inc	1560-0086	VOC	17.33
Lexington	Safety Kleen:Lexington	1560-0039	VOC	13.15
Lexington	Eagle Aviation Inc	1560-0082	VOC	9.12
Lexington	BC Components	1560-0054	VOC	8.87
Lexington	Icon Identity Solutions	1560-0131	VOC	6.58
Lexington	Corley & Sons Sawmill	1560-0068	VOC	6.14
Lexington	Boral Bricks:Lexington	1560-0006	VOC	2.33
Lexington	Lexington Medical Center:West Columbia	1560-0055	VOC	0.23
Lexington	US Silica	1560-0005	VOC	0.23
Lexington	* Martin, JB	1560-0095	VOC	0.18
Lexington	Columbia Farms:Sunset Blvd	1560-0121	VOC	0.12
Lexington	Rea Construction:Plant 51	9900-0083	VOC	0.06
Lexington	Fosterdixana:Quarry	1560-0038	VOC	0.05
Lexington	Lanier Construction:Gaston Asphalt	9900-0035	VOC	0.03
Lexington	Sloan Construction:#16	9900-0060	VOC	0.03
Lexington	Columbia Silica Sand	1560-0037	VOC	0.01
	1999 Lexington Co. Total			**975.39**
	Emissions in Nonattainment Area-Total			**955.06**
	Emissions in Nonattainment Area-Percent			**97.9%**
Richland	Central Products Co DBA IPG Group	1900-0033	VOC	2,075.48
Richland	* International Paper:Eastover	1900-0046	VOC	374.92
Richland	SMI Joist:Eastover	1900-0150	VOC	156.95
Richland	* SCE&G:Wateree	1900-0013	VOC	53.46
Richland	Plasti-Line Columbia	1900-0169	VOC	39.81
Richland	Consolidated Systems	1900-0040	VOC	39.04
Richland	Casco Impregnated Papers	1900-0093	VOC	30.88
Richland	Kline Iron & Steel:Columbia	1900-0038	VOC	23.47

Table D-2: MSA Point Source VOC Emissions				
County	**Plant Name**	**Permit Number**	**Pollutant**	**Point Source-VOC (Tons / Year)**
Richland	FN Manufacturing	1900-0052	VOC	19.31
Richland	Dimas North America	1900-0082	VOC	10.51
Richland	Shakespeare:Columbia	1900-0036	VOC	8.84
Richland	Hueck Foils LLC	1900-0146	VOC	7.38
Richland	Tyler Inc	1900-0133	VOC	6.88
Richland	American Spiralweld Pipe	1900-0179	VOC	4.70
Richland	US Army:Ft Jackson	1900-0016	VOC	4.56
Richland	Richtex Brick:Columbia	1900-0010	VOC	4.10
Richland	* Richland Landfill	1900-0148	VOC	3.79
Richland	Carolina Ceramics	1900-0007	VOC	0.71
Richland	US VA Hospital:Columbia	1900-0023	VOC	0.71
Richland	USC:Columbia Campus Energy Facility	1900-0143	VOC	0.67
Richland	SC DMH:Bull St	1900-0055	VOC	0.24
Richland	Palmetto Richland Memorial Hospital	1900-0062	VOC	0.20
Richland	SC General Services:Energy Facility	1900-0162	VOC	0.13
Richland	SC General Services:Columbia Mills	1900-0161	VOC	0.10
Richland	Jackson, CR:Asphalt	9900-0036	VOC	0.09
Richland	SC General Services:Haynes	1900-0109	VOC	0.07
Richland	American Italian Pasta Co	1900-0130	VOC	0.07
Richland	Sloan Construction:# 7	9900-0055	VOC	0.06
Richland	Palmetto Baptist Medical Center:Columbia	1900-0044	VOC	0.03
Richland	Rea Construction:Plant 52	9900-0081	VOC	0.03
Richland	SC General Services:Sims/Aycock	1900-0104	VOC	0.02
Richland	Colprovia Asphalt #1	9900-0025	VOC	0.01
Richland	SCE&G:Coit	1900-0132	VOC	0.01
	1999 Richland Co. Total			**2,867.23**
	Emissions in Nonattainment Area-Total			**2,435.06**
	Emissions in Nonattainment Area-Percent			**84.9%**

Table D-3 lists the NO_x on-road emissions for Lexington and Richland Counties and Table D-4 lists the VOC on-road emissions.

Table D-3: Lexington And Richland Counties On-road NO_x Emissions			
County	**Tier 1**	**Tier 2**	**Highway NO_x (Tons Per Year)**
Lexington	11-Highway Vehicles	01-Light-Duty Gas Vehicles & Motorcycles	2,818.00
Lexington	11-Highway Vehicles	02-Light-Duty Gas Trucks	1,554.00
Lexington	11-Highway Vehicles	03-Heavy-Duty Gas Vehicles	409.00

Table D-3: Lexington And Richland Counties On-road NO_x Emissions			
County	**Tier 1**	**Tier 2**	**Highway NO_x (Tons Per Year)**
Lexington	11-Highway Vehicles	04-Diesels	3,518.00
	1999 Lexington Co. Total		**8,299.00**
Richland	11-Highway Vehicles	01-Light-Duty Gas Vehicles & Motorcycles	3,776.00
Richland	11-Highway Vehicles	02-Light-Duty Gas Trucks	2,077.00
Richland	11-Highway Vehicles	03-Heavy-Duty Gas Vehicles	530.00
Richland	11-Highway Vehicles	04-Diesels	3,712.00
	1999 Richland Co. Total		**10,095.00**

Table D-4: Lexington And Richland Counties On-road VOC Emissions			
County	**Tier 1**	**Tier 2**	**Highway VOC (Tons Per Year)**
Lexington	11-Highway Vehicles	01-Light-Duty Gas Vehicles & Motorcycles	3,155.00
Lexington	11-Highway Vehicles	02-Light-Duty Gas Trucks	1,788.00
Lexington	11-Highway Vehicles	03-Heavy-Duty Gas Vehicles	422.00
Lexington	11-Highway Vehicles	04-Diesels	230.00
	1999 Lexington Co. Total		**5,595.00**
Richland	11-Highway Vehicles	01-Light-Duty Gas Vehicles & Motorcycles	5,003.00
Richland	11-Highway Vehicles	02-Light-Duty Gas Trucks	2,793.00
Richland	11-Highway Vehicles	03-Heavy-Duty Gas Vehicles	648.00
Richland	11-Highway Vehicles	04-Diesels	290.00
	1999 Richland Co. Total		**8,734.00**

E. Traffic and Commuting Patterns

Estimates of the Daily Vehicle Miles Traveled (DVMT) were obtained from the South Carolina Department of Transportation (SCDOT). SCDOT determines current DVMT by multiplying traffic volume (through traffic counts) and lane miles (determined by the Highway Performance Monitoring System) for each particular area. The South Carolina Department of Public Safety, Division of Motor Vehicles, provided motor vehicle registration data. All other data in this section was obtained from the US Census Bureau. All data is based on the year 2000.

Table E-1 shows the 2000 and 2025 DVMT data for Richland and Lexington Counties and the recommended Columbia nonattainment area. Table E-1 also shows that the proposed boundary captured approximately 91% of the DVMT in 2000, and is projected to capture approximately 93% of the DVMT in 2025.

Table E-1: DVMT for Columbia Nonattainment Area			
County	**2000 Daily VMT**	**2025 Daily VMT**	**Daily VMT Change (2000-2025)**
Lexington	6,973,149	11,535,014	4,561,865
Richland	8,940,822	14,147,703	5,206,881
County Total	15,913,971	25,682,717	9,768,746
Columbia Nonattainment Total[8]	14,613,688	23,925,840	9,312,152
% VMT Captured inside Nonattainment Area	91.83	93.16	

Figure E-1 shows the Interstates that are located within the recommended Columbia nonattainment area. There are three interstates (I-20, I-26 and I-77). I-20 is the major corridor of travel between Aiken and Columbia, South Carolina; I-26 is the major corridor of travel between Spartanburg and Charleston, South Carolina; and I-77 originates in Columbia, South Carolina and is the major travel corridor to Rock Hill, South Carolina. Additionally, there are seven other major routes of travel through Lexington and Richland Counties. They include US Highways 601, 1, 76, 378, 176, 321 and 21. There are also numerous State and secondary roads that connect the larger towns. This figure also shows the 2000 traffic counts for the interstates. The highest traffic occurs near the intersection of I-26 and I-20, which is located within the proposed boundary. The areas of Richland and Lexington Counties that are not included in the recommended Columbia nonattainment area had minimal traffic counts in 2000.

[8] Columbia Nonattainment Area Totals based on MPO figures and may reflect an overestimation of the total percent captured by the boundary.

Figure E-4

Table E-2[9] presents the breakdown by road classifications of DVMT traveled in the recommended Columbia nonattainment area from 2000 and projected through 2025.

Table E-2:
DVMT Data for Recommended Columbia Nonattainment Area

	2000	Projected 2007	Projected 2012	Projected 2025
Richland County				
Rural Interstate (01)	725,336	754,205	774,826	828,441
Rural Principal Arterial (02)	420,790	456,077	474,425	539,783
Rural Minor Arterial (03)	443,596	480,795	500,137	569,038
Rural Major Collector (04)	536,401	581,383	604,772	688,088
Rural Minor Collector (05)	40,569	43,971	45,740	52,041
Rural Local (09)	170,943	185,278	192,732	219,283
Rural Total	2,337,634	2,501,709	2,592,633	2,896,673
Urban Interstate (11)	2,774,170	3,772,385	4,485,395	6,339,223
Urban Freeway/Expressway (12)	288,218	312,388	324,955	369,722
Urban Principal Arterial (13)	1,266,937	1,373,181	1,428,424	1,625,207
Urban Minor Arterial (14)	1,378,322	1,493,906	1,554,006	1,768,090

[9] Data provided by SCDOT

Table E-2: DVMT Data for Recommended Columbia Nonattainment Area				
	2000	**Projected 2007**	**Projected 2012**	**Projected 2025**
Urban Collector (15)	591,700	641,320	667,120	759,024
Urban Local (18)	303,842	329,322	342,570	389,764
Urban Total	6,603,188	7,922,501	8,802,471	11,251,030
Grand Total DVMT	8,940,822	10,424,210	11,395,103	14,147,703
Lexington County				
Rural Interstate (01)	1,337,570	1,775,666	2,088,591	2,902,198
Rural Principal Arterial (02)	523,763	611,649	655,699	819,296
Rural Minor Arterial (03)	694,399	810,917	869,318	1,086,213
Rural Major Collector (04)	747,862	873,351	936,248	1,169,842
Rural Minor Collector (05)	73,744	86,118	92,320	115,354
Rural Local (09)	388,566	453,767	486,446	607,814
Rural Total	3,765,903	4,611,467	5,128,623	6,700,716
Urban Interstate (11)	1,277,794	1,428,535	1,536,207	1,816,154
Urban Freeway/Expressway (12)	38,982	45,523	48,802	60,978
Urban Principal Arterial (13)	627,562	732,865	785,645	981,663
Urban Minor Arterial (14)	651,297	760,582	815,358	1,018,790
Urban Collector (15)	338,872	395,733	424,234	530,080
Urban Local (18)	272,740	318,505	341,443	426,633
Urban Total	3,207,246	3,681,743	3,951,689	4,834,298
Grand Total DVMT	**6,973,149**	**8,293,210**	**9,080,311**	**11,535,014**

Tables E-3[10] and E-4 present the 2000 worker flow data from each of the counties. Some counties that are listed on this table are not being considered for boundary recommendations, and are being included on this chart to account for all workers in each county. This table shows that approximately 54% of workers that live in Lexington County work inside the county. Approximately 88% of the workers that work outside the county commute to Richland County. This table also shows that approximately 83% of workers that live in Richland County work inside the county. Approximately 70% of the workers that work outside the county commute to Lexington County.

Table E-3: Where People Living in the Columbia MSA Work			
County Worked In	**County of Residence**		
	Lexington	**Richland**	**Grand Total**
Abbeville	0	15	15
Aiken	613	118	731
Allendale	30	7	37
Anderson	15	10	25
Bamberg	60	55	115
Barnwell	32	9	41

[10] Data provided from US Census: 2000

Table E-3: Where People Living in the Columbia MSA Work			
County Worked In	**County of Residence**		
	Lexington	**Richland**	**Grand Total**
Beaufort	69	72	141
Berkeley	62	36	98
Calhoun	233	121	354
Charleston	264	187	451
Cherokee	6	40	46
Chester	35	36	71
Chesterfield	0	36	36
Clarendon	11	27	38
Colleton	25	6	31
Darlington	31	74	105
Dillon	0	7	7
Dorchester	14	26	40
Edgefield	75	5	80
Fairfield	535	1,447	1,982
Florence	145	107	252
Georgetown	7	11	18
Greenville	131	220	351
Greenwood	98	65	163
Hampton	1	7	8
Horry	83	75	158
Kershaw	258	911	1,169
Lancaster	178	412	590
Laurens	42	37	79
Lee	8	81	89
Lexington	58,998	18,860	77,858
Marion	0	17	17
Marlboro	0	9	9
Newberry	606	694	1,300
Oconee	31	107	138
Orangeburg	520	411	931
Pickens	15	20	35
Richland	44,237	129,047	173,284
Saluda	218	43	261
Spartanburg	27	118	145
Sumter	200	546	746
Union	8	6	14
Williamsburg	6	10	16
York	146	119	265
Grand Total	108,073	154,267	262,340

Table E-4: Where People Living in the Columbia MSA Work			
County Worked In	**County of Residence**		
	Lexington	**Richland**	**Grand Total**
Abbeville	0.00%	0.01%	0.01%
Aiken	0.23%	0.04%	0.28%
Allendale	0.01%	0.00%	0.01%
Anderson	0.01%	0.00%	0.01%
Bamberg	0.02%	0.02%	0.04%
Barnwell	0.01%	0.00%	0.02%
Beaufort	0.03%	0.03%	0.05%
Berkeley	0.02%	0.01%	0.04%
Calhoun	0.09%	0.05%	0.13%
Charleston	0.10%	0.07%	0.17%
Cherokee	0.00%	0.02%	0.02%
Chester	0.01%	0.01%	0.03%
Chesterfield	0.00%	0.01%	0.01%
Clarendon	0.00%	0.01%	0.01%
Colleton	0.01%	0.00%	0.01%
Darlington	0.01%	0.03%	0.04%
Dillon	0.00%	0.00%	0.00%
Dorchester	0.01%	0.01%	0.02%
Edgefield	0.03%	0.00%	0.03%
Fairfield	0.20%	0.55%	0.76%
Florence	0.06%	0.04%	0.10%
Georgetown	0.00%	0.00%	0.01%
Greenville	0.05%	0.08%	0.13%
Greenwood	0.04%	0.02%	0.06%
Hampton	0.00%	0.00%	0.00%
Horry	0.03%	0.03%	0.06%
Kershaw	0.10%	0.35%	0.45%
Lancaster	0.07%	0.16%	0.22%
Laurens	0.02%	0.01%	0.03%
Lee	0.00%	0.03%	0.03%
Lexington	22.49%	7.19%	29.68%
Marion	0.00%	0.01%	0.01%
Marlboro	0.00%	0.00%	0.00%
Newberry	0.23%	0.26%	0.50%
Oconee	0.01%	0.04%	0.05%
Orangeburg	0.20%	0.16%	0.35%
Pickens	0.01%	0.01%	0.01%
Richland	16.86%	49.19%	66.05%
Saluda	0.08%	0.02%	0.10%
Spartanburg	0.01%	0.04%	0.06%
Sumter	0.08%	0.21%	0.28%
Union	0.00%	0.00%	0.01%
Williamsburg	0.00%	0.00%	0.01%
York	0.06%	0.05%	0.10%
Grand Total	41.20%	58.80%	100.00%

Table E-5 presents the mobile source emissions for the Columbia MSA. Lexington County accounts for 44.88% and 40.41% of the mobile source NO_x and VOC, respectively. Richland County accounts for 55.12% and 59.59% of the mobile source NO_x and VOC, respectively. Even though both of these counties have high mobile source NO_x and VOC emissions, Federal engine and fuel standards will offset the impact of these emissions.

Table E-5:
Percent Mobile Source NO_x and VOC Emissions in the Columbia MSA

County	NO_x tons / day	Percent NO_x	County	VOC tons / day	Percent VOC
Lexington	22.53	44.88%	Lexington	14.47	40.41%
Richland	27.67	55.12%	Richland	21.34	59.59%
Grand Total	50.20	100.00%	Grand Total	35.81	100.00%

Figures E-2 through E-6 show the urban and rural DVMT for the Columbia MSA. While Lexington County DVMT increases 129% from 1990-2025, the character of the miles traveled changes very little. For example, in 1990, the DVMT is 52.0% rural and 48.0% urban, while in 2025; the DVMT is projected to be 58.1% rural and 41.9% rural. While Richland County DVMT increases 110% from 1990-2025, the character of the miles traveled changes very little. For example, in 1990, the DVMT is 29.1% rural and 70.9% urban, while in 2025; the DVMT is projected to be 20.5% rural and 79.5% rural.

Figure E-2:
1990 Columbia MSA Urban vs. Rural DVMT

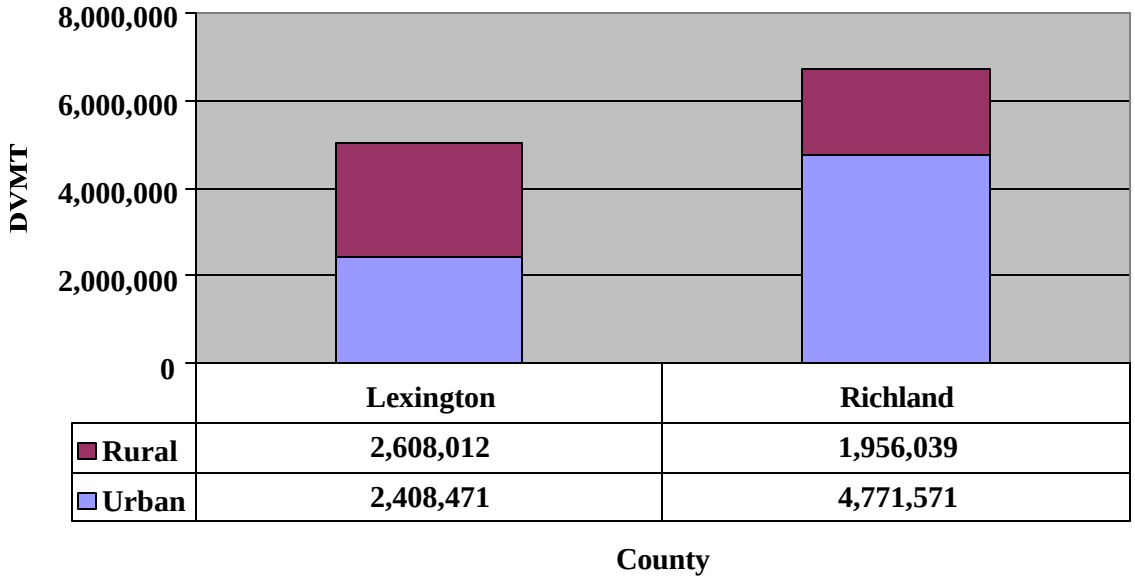
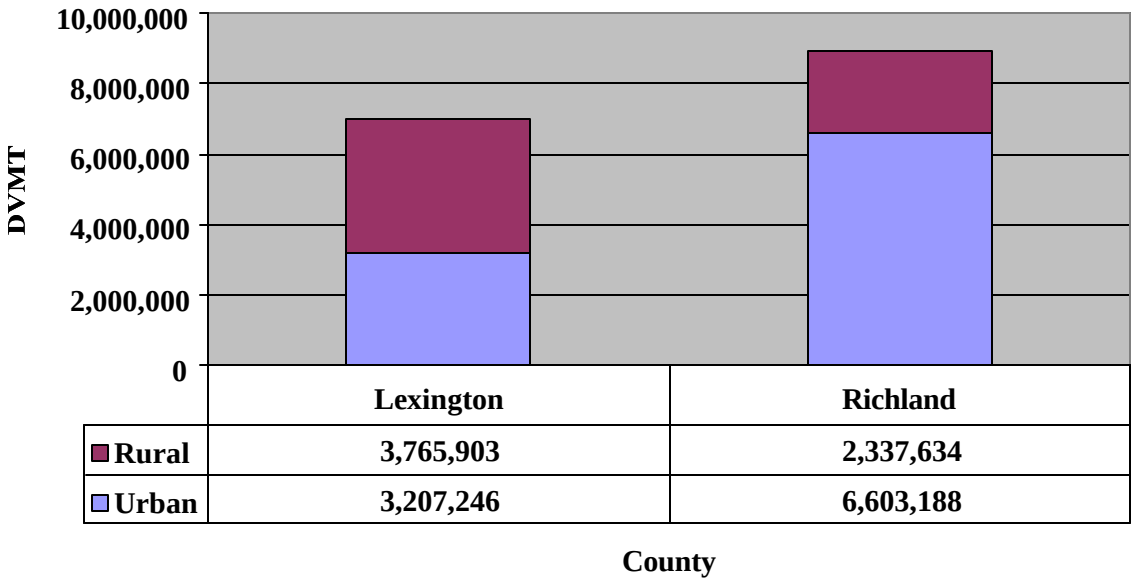


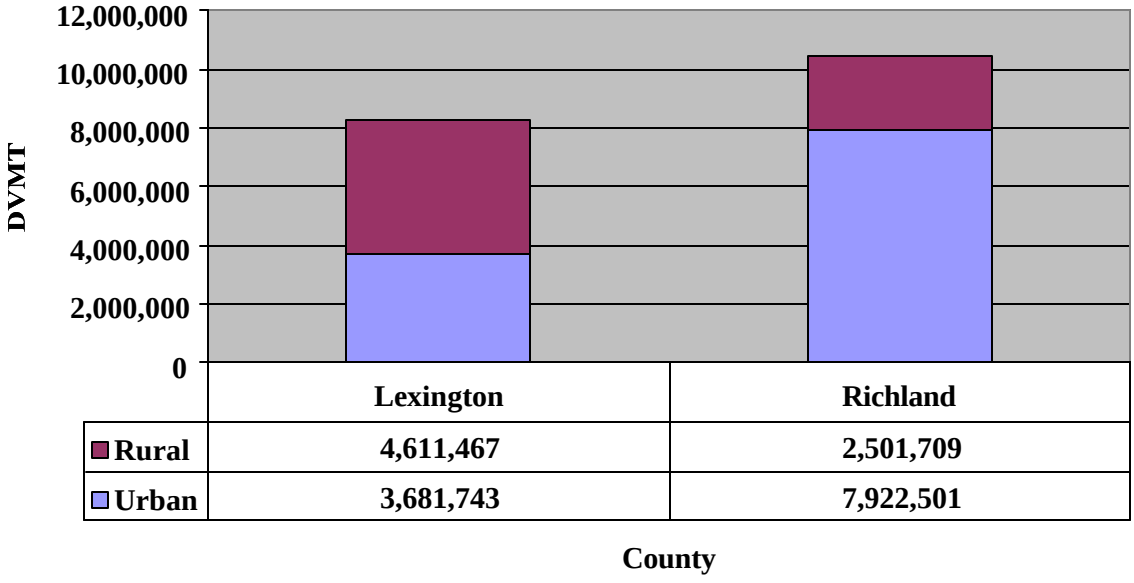
Figure E-3:
2000 Columbia MSA Urban vs. Rural DVMT



	Lexington	Richland
Rural	3,765,903	2,337,634
Urban	3,207,246	6,603,188

County

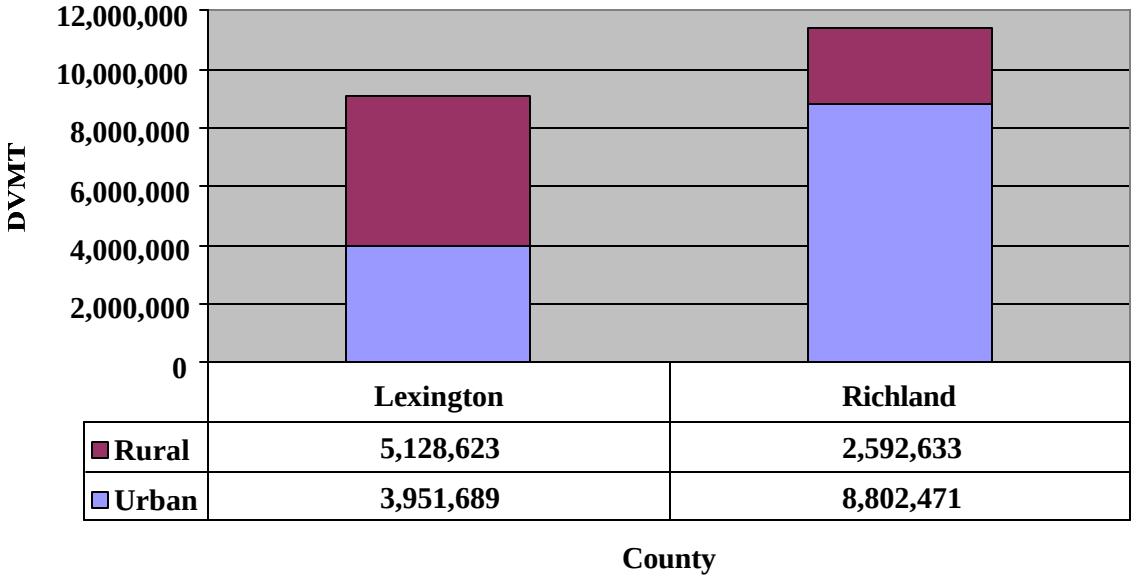
Figure E-4:
2007 Columbia MSA Urban vs. Rural DVMT



	Lexington	Richland
Rural	4,611,467	2,501,709
Urban	3,681,743	7,922,501

County

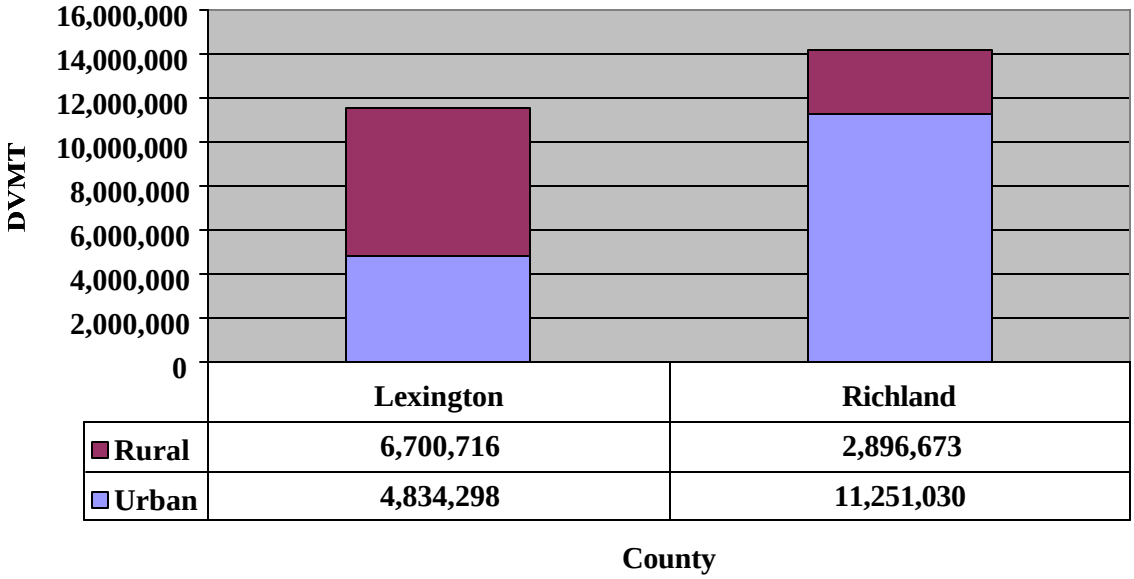
Figure E-5:
2012 Columbia MSA Urban vs. Rural DVMT



	Lexington	Richland
Rural	5,128,623	2,592,633
Urban	3,951,689	8,802,471

County

Figure E-6:
2025 Columbia MSA Urban vs. Rural DVMT

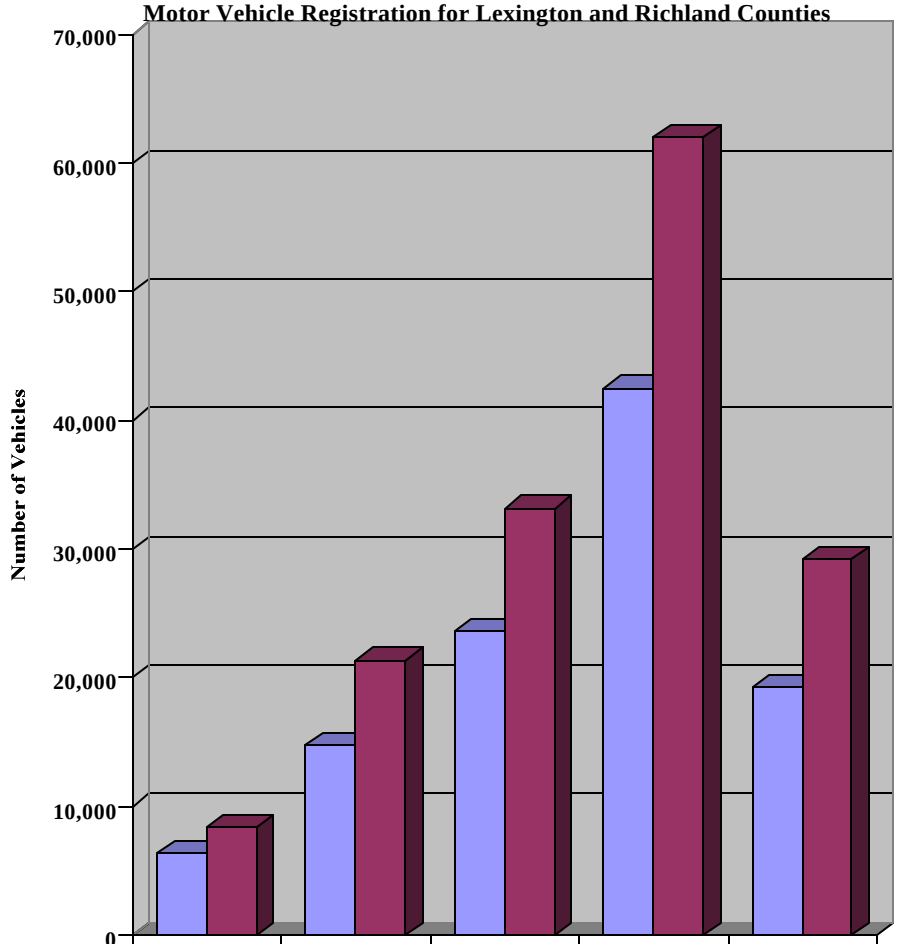


	Lexington	Richland
Rural	6,700,716	2,896,673
Urban	4,834,298	11,251,030

County

Figure E-7[11] presents the motor vehicle registration data for Lexington and Richland Counties. Only a small portion of the vehicles are pre-1981 model years. In 1981, new cars were outfitted with three-way catalysts, on-board computers, and oxygen sensors to help increase the efficiency of the catalytic converters. This figure shows that the majority of cars registered are model years 1991-1995. In 1991 the EPA established lower tailpipe standards for hydrocarbons and nitrogen oxides beginning with 1994 models.

Figure E-7:
Motor Vehicle Registration for Lexington and Richland Counties



	<1979	1980-1986	1987-1990	1991-1995	1996-2001
Lexington	6,320	14,779	23,616	42,499	19,291
Richland	8,338	21,373	33,144	62,005	29,203

Model Year

[11] Data provided from South Carolina Department of Public Safety: Division of Motor Vehicles

Since this data reflects 2000 registration figures, many of the older vehicles have probably been replaced with newer vehicles. These vehicle turnovers, combined with future national low sulfur fuel standards, the use of Onboard Diagnostic (OBD) systems and Onboard Refueling Vapor Recovery (ORVR) systems, will help to offset any potential impacts from the increased emissions from mobile sources in this area.

F. Expected Growth (Including Extent, Pattern, and Rate of Growth)

Limited data is available in assessing expected growth for the recommended Columbia nonattainment area. Conclusions were drawn based on historical data from 1990, current data from 2000, and population projections for 2020 as contained in Table F-1. Economic growth, relative to population growth, is even harder to predict. No knowledge of major economic expansions is available. While it is certain that population counts will grow, it is only assumed that current economic factors will remain stable or that some economic growth will occur. It is reasonable to expect the majority of that growth to be located inside, or at least near, the recommended Columbia nonattainment area.

Table F-1:
Historical and Projected Population and Population Density per County

	Richland County	Lexington County
Population, 1990[12]	286,321	167,526
Population, 2000 [13]	320,677	216,014
Projected Population, 2020[14]	373,370	291,600
County Growth Rate, 2000 - 2020	16.41%	34.99%

Based on the projected population for 2020, the county growth rate for Rich1and and Lexington Counties is 16.41% and 34.99%, respectively. Assuming county growth is equally distributed throughout the county, the projected population of the recommended area for the year 2020 is 609,348 (the summation of Richland County's growth rate times its recommended area population, Lexington County's growth rate times its recommended area population, and the recommended area population). However, equal distribution of growth is unlikely, due in part to the distribution of the urban and rural populations in the counties. With some degree of certainty, the future growth in Richland and Lexington Counties will be contained in the recommended area.

Additionally, since the boundary captures the area's urban population, land area, and the majority of the businesses, it is reasonable to conclude that the boundary at least approximates, if not contains, the expected population growth, and hence the economic growth, for the area in the coming years.

G. Climatology / Meteorology

The overall climatology of an area is paramount to the formation and mass movement of secondary pollutants such as ozone throughout the lowest layers of the troposphere. As a result, though the overall emission volume may remain constant across a given monitoring site, the ambient concentration of ozone at that site may change according to even the most subtle shift in the overall weather pattern. This is

[12] Data provided by US Census: 2000.
[13] Data provided by US Census: 2000.
[14] Data provided by US Census: 2000.

indeed the rule across the whole of the State of South Carolina.

The "Ozone Season" in South Carolina runs from April 1 through October 31 of each year, roughly parallel to that experienced in most areas of the Southeastern United States. The main climatological feature influencing the overall weather pattern during this period is a large ridge of stable, sinking air known as the "Bermuda High." This semi-permanent feature is normally situated just off the South Atlantic Seaboard, with its core of anticyclonic circulation centered due east of South Carolina. The average strength and position of this ridge provides a steady southwesterly flow of moist, tropical air from the Gulf of Mexico that, under normal circumstances, keeps the lower atmosphere well mixed and quite humid. These are two main factors that normally provide conditions non-conducive to the formation of elevated levels of ozone.

When the Bermuda High becomes anomalously shifted from its normal position, conditions conducive to the formation of elevated ozone may occur in many areas of South Carolina. This is mainly the case in the months during the Ozone Season immediately following an El Nino winter. During this period, which only occurs once every 4 or 5 years, the Bermuda High flattens out and builds southwestward well into the Gulf of Mexico. This shifts the moist flow out of the Gulf to the west, well away from the South Atlantic Coast. With the core of the ridge virtually parked on top of South Carolina, air stagnation can occur.

The three main underlying causes of air stagnation under this shifted Bermuda High are lack of horizontal wind flow, a stable boundary layer, and, most importantly, reduced availability of ambient moisture. In such a situation, the lower atmosphere dries out considerably, with less cloud coverage available to absorb the incoming solar radiation (UV) needed for efficient conversion of ozone from its primary component pollutants. In addition, there is much less titration and/or deposition of the pollutant back to its basal components after nightfall, when the UV source is removed. Once ozone formation perpetuates, the stable air mass traps it, pooling it closer to the ground. With little horizontal wind flow available to mix the atmosphere, the pollutant takes much longer to disperse throughout the boundary layer.

Air stagnation under an anomalous Bermuda High occurs far too sparingly to account for every elevated ozone event in South Carolina. Frequently, elevated ozone readings have been monitored when conditions were not altogether favorable for its production in that particular area. It is in these cases where transport of ozone from upwind sources comes into play.

H. Geography / Topography

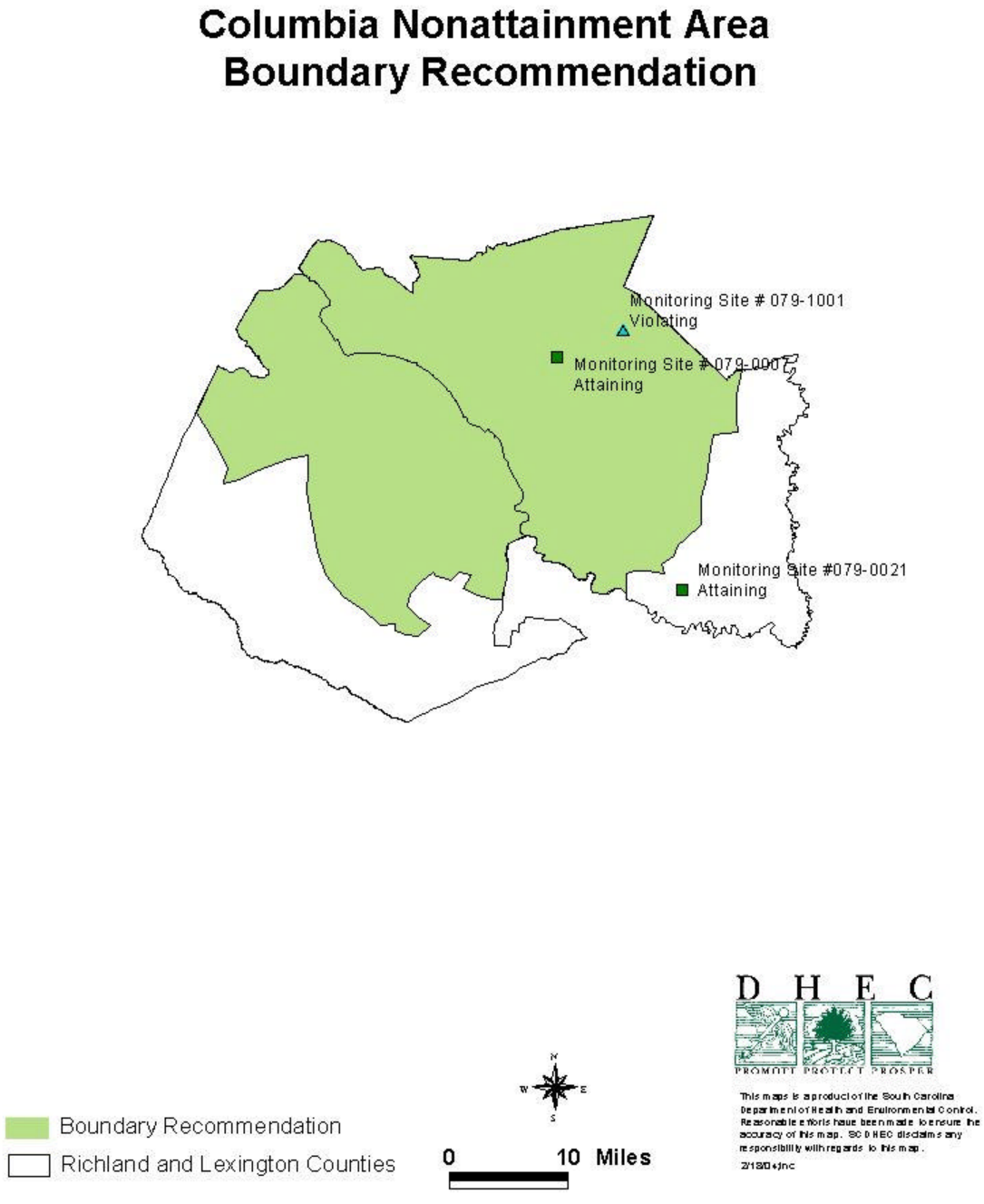
The topography of South Carolina is divided into two distinct areas, commonly known as the Piedmont and the Coastal Plain. The recommended Columbia nonattainment area is located in both areas. The line of demarcation runs from the eastern boundary of Aiken County through central Chesterfield County to the North Carolina border. Along this line elevations begin at about 300 feet and increase in steps to over 1,000 feet in the extreme northwestern counties, culminating in isolated peaks of 2,000 to over 3,500 feet above mean sea level. East of the line, there are evidences of outcroppings from the lower Appalachians in a ridge of low hills and rather broken country between the Congaree River and the north fork of the Edisto River, and also in a rather hilly and rolling region in the upper Lynches River drainage basin between the Catawba-Wateree and the Great Pee Dee Rivers. In about one-third of the coastal plain (or what is commonly known as the upper coastal plain), the elevations decrease rather abruptly from 300 to 100 feet, thence to the coast. The major part of the coastal area is not over 60 feet above mean sea level. In this region of lower levels, to the eastward and southward, the great swamp systems of the State predominate.

The slope of the land from the mountains seaward is toward the southeast, and all of South Carolina's streams naturally follow that general direction to the Atlantic Ocean. The South Piedmont section of the State is on the eastern slope of the Appalachian Mountains with the main ridge of the mountains about 30 miles west. To some extent these mountains act as a barrier for the wind and tend to protect the area from the full force of the cold air masses during the winter months. The relatively flat areas of the Central Plains and the coastal region allow free air movement and are conducive to effective dispersion of pollutants.

I. Jurisdictional Boundaries

Figure I-1 shows the Department's recommended Columbia nonattainment area boundary.

Figure I-1



Starting point at I-77 at the county line of Richland/Fairfield and follows county line northeast for 9.6 miles to intersection of Richland/Fairfield/Kershaw county lines.

Follows county line of Richland/Kershaw southwest for 6.0 miles and then turns southeast for 11 miles over I-20 and SC 12. Turns northeast for 1.5 miles to US 601 (McCords Ferry Rd).

Follows US 601(McCords Ferry Rd) south for 5.2 miles to SC 262 (Leesburg Rd).

Follows SC 262 (Leesburg Rd) west for 2.2 miles to S-40-69 (Congress Rd).

Follows S-40-69 (Congress Rd) south for 3.6 miles to Toms Creek.

Follows Toms Creek South across US 76/378 (Garners Ferry Rd) for 5.8 miles to S-40-67 Zeigler Rd).

Follows S-40-67 (Zeigler RD) west for 0.5 miles to SC-769 (Congaree Rd).

Follows SC-769 (Congaree Rd) northwest for 0.2 miles to Dry Branch.

Follows Dry Branch southwest for 3.6 miles, past SC 48 (Bluff Rd) and S-40-734 (Old Bluff Rd) to power lines.

Follows power lines west for 1.6 miles to S-40-734 (Old Bluff Rd).

Follows S-40-734 (Old Bluff Rd) west for 1.6 miles to Cedar Creek.

Follows Cedar Creek South 0.1 miles to Congaree Swamp National Monument boundary.

Follows Congaree Swamp National Monument boundary south for 2.0 miles to Congaree River.

Follows Congaree River north to Richland/Lexington/Calhoun County Line.

Follows Lexington/Calhoun county line to S-32-65 (Mack St) and S-32-32 and Pine Plain Rd.

Follows S-32-65 (Mack St) west for 3.0 miles to US 321 (Main St).

Follows US 321 (Main St) north for 1.5 miles to Woodtrail Dr. (S-32-663).

Follows Woodtrail Dr (S-32-663) west for 3.5 miles to Shalam Dr.

Follows Shalam Dr. northwest for 0.5 miles to end and then to Fish Hatchery Rd (S-32-73) at Placid Valley Rd.

Follows Fish Hatchery Rd (S-32-79) southwest for 2.7 miles to SC 6.

Follows SC 6 Southeast for 3.0 miles to W.E. Jeffcoat Rd (S-32-100).

Follows W.E. Jeffcoat Rd (S-32-100) southwest for 1.5 miles to Sharon Church Rd (S-32-342).

Follows Sharon Church Rd (S-32-342) northwest for 0.1 miles to Jeff Sharpe Rd.

Follows Jeff Sharpe Rd west for 1.5 miles to Cherry Blossom Rd.

Follows Cherry Blossom Rd north for 0.3 miles to Hilton Yonce Rd.

Follows Hilton Yonce Rd northwest for 0.7 miles to Pelion Rd (S-32-247).

Follows Pelion Rd (S-32-247) west for 1.4 miles to Old Charleston Rd (S-32-625).

Follows Old Charleston Rd (S-32-625) northwest for 6.5 mile past US 302 (Edmund Hwy) to Calks Ferry Rd (S-32-278).

Follows Calks Ferry Rd (S-32-278) north for 9.0 miles over I-20 to US 1 (Augusta Hwy).

Follows US 1 (Augusta Hwy) west for 7.0 miles to Old Field Rd (S-32-31).

Follows Old Field Rd (S-32-31) north for 1.8 to Cedar Grove Rd (S-32-54).

Follows Cedar Grove Rd (S-32-54) northwest for 3.0 miles to Ansel Caughman Rd (S-32-157).

Follows Ansel Caughman Rd (S-32-157) northwest for 1.5 miles to Lexington/Saluda county line.

Follows Lexington/Saluda county line northeast for 3.5 miles to intersection of Lexington/Saluda/Newberry county line.

Follows Lexington/Newberry county line east, northwest, northeast and east for 17 miles to Lexington/Newberry/Richland county line intersection.

Follows Richland/Newberry county line northeast for 3.0 miles to Broad River/ Richland/Fairfield county line.

Follows Richland/Fairfield county line southeast on Broad River for 9.0 miles, then north on Little River for 3.0 miles and east and northeast to I-77 for 10 miles and to starting point.

J. Level of Control of Emission Sources

Local Controls

Through their participation with the Early Action Compact, Lexington and Richland Counties are both exploring countywide local control strategies to be implemented no later than April 2005. For Lexington County, these strategies include park and ride facilities, alternative commute options, alternative fuels and landfill methane reduction. Strategies under consideration by Richland County include strengthening land-use planning, alternative vehicles, ozone awareness and education, alternative work schedules, participation in Clean Cities, and open burning restrictions. A complete listing of the emission reduction strategies for each county was submitted to EPA in December 2003. This list will be updated in March 2004 upon submittal of the final Lexington County Early Action Plan and the Richland County Early Action Plan.

Emission Control Strategies

The Department is primarily responsible for ensuring attainment and maintenance of the air quality standards established by EPA. Under section 110 of the CAA and related provisions, the Department must submit, for EPA approval, state implementation plans that provide for the attainment and maintenance of such standards through control programs directed to sources of the pollutants involved. The Department, in conjunction with EPA, also administers the prevention of significant deterioration (PSD) programs for these pollutants. In addition, Federal programs provide for nationwide reductions in emissions of these and other air pollutants under Title II of the CAA, which involves controls for automobile, truck, bus, motorcycle, off-road engine, and aircraft emissions. Since its inception in 1973, the Department has worked diligently to carry out the task of enforcing the CAA. The Department has also been delegated the authority to administer the new source performance standards under section 111 of the CAA and the national emission standards for hazardous air pollutants under section 112 of the CAA. During the past decade, the air quality in South Carolina has complied with all air quality standards, an accomplishment very few other States can claim.

If additional control measures are required to attain the air quality standard, the Department has the statutory authority to promulgate and implement regulations and to require more stringent controls on industrial and mobile sources to realize appropriate emissions reductions outside of nonattainment areas. Further, our recent actions, such as addressing NO_x emissions from stationary sources, demonstrate our ability and political will to implement controls to improve air quality statewide rather than on an area or county level basis.

The Department proposed *R.61-62.5, Standard No. 5.2, Control of Oxides of Nitrogen (NO_x)*, on January 8, 2004. The purpose of this regulation is to reduce or regulate the growth of ozone precursors so that the ozone monitors in the state are attaining the ozone standard in 2007. When fully implemented as proposed, this new regulation has the potential to reduce 3,000 tons of NO_x from these sources.

As part of the Early Action Compact (EAC) process another regulation that the Department is revising in an effort to reduce NO_x emissions statewide is R. 61-62.2, *Prohibition of Open Burning*. The most significant revisions to this regulation are as follows: deleting the exception for the burning of household trash, modifiying the exception for the burning of construction waste, and revising the exception for fires set for the purpose of firefighter training. The burning of household trash and construction waste presents health and environmental concerns for many communities. Elimination of the burning of household trash will result in a statewide reduction of 2,379 tons per year of NO_x and 11,896 tons per year VOC. While the revisions to the burning of construction waste and fires set for the purpose of firefighter training are more difficult to quantify, these revisions will decrease NO_x and VOC emissions from these activities.

Early Action Plan

The health of the citizens of South Carolina is a primary concern and the Department continues to seek proactive measures to meet our commitment to public health and environmental protection. South Carolina has been in attainment of the 1-hour ozone standard for the past decade, and will make every effort to attain the new 8-hour ozone air quality standard in all areas of the State as expeditiously as possible.

EPA has provided an option for areas currently meeting the 1-hour ozone standard, like those in South Carolina, to attain the 8-hour ozone standard by December 31, 2007, and obtain cleaner air sooner than Federally mandated. This option requires an expeditious time line for achieving emissions reductions sooner than expected under the 8-hour ozone implementation rulemaking, while providing "fail-safe" provisions for the area to revert to the traditional SIP process if specific milestones are not met. Forty-five of South Carolina's forty-six counties have entered into Early Action Compacts. This action indicates that the local governments in the State of South Carolina are very concerned with air quality. Many of the counties entering into the Early Action Compacts do not have problems meeting the air quality standard and yet are still willing to plan and work with other areas to implement controls to ensure early attainment of the standards.

Interested stakeholders (i.e., local, State, and Federal government, citizens, public interest groups, and the business community) have been and will continue to be involved in the planning. By signing the Early Action Compact (EAC), EPA is agreeing to defer the effective date of the nonattainment designation for participating areas. However, areas that enter into an EAC but do not meet all of the terms of the EAC, including established milestones, will forfeit participation and be designated according to requirements within EPA's 8-hour ozone implementation rule. At a minimum, those requirements will include Transportation Conformity and nonattainment New Source Review.

Local areas are required to develop and implement a local early action plan that will promote the area's attainment by December 31, 2007, and maintenance of the standard until at least 2012. The local area must adopt local control strategies necessary to demonstrate attainment of the 8-hour ozone standard. The final local plan is due to the Department in March 2004.

The Department is required to develop and implement a State early action SIP demonstrating the participating area's attainment by December 31, 2007, and maintenance until at least 2012. The Department is currently evaluating the possibility of projecting out to 2017 to evaluate the air quality ten years after the "attainment" date. The SIP is due to EPA by December 31, 2004. The State must adopt local control strategies necessary to demonstrate attainment of the 8-hour ozone standard. Potential control strategies were identified to EPA on June 16, 2003. Final strategies are to be implemented no later than April 1, 2005. If the monitors in the nonattainment areas reflect attainment by December 31, 2007, the area will be designated as attainment and no additional requirements will be imposed (i.e., Transportation Conformity and nonattainment New Source Review).

Ozone Forecasting – Spare The Air

The South Carolina Spare the Air campaign was created by the Department's Bureau of Air Quality to educate citizens about air quality and its relationship to their health. This program provides information to the public about their air quality and warns them when levels of ozone are expected to be elevated so that they can better protect their health as well as allow them the opportunity to take actions to reduce emissions from their own activities. During the period of May 1 through September 30, the Bureau of Air Quality staff meteorologists produce daily ozone forecasts for the Upstate, Midlands, Pee Dee, and

Central Savannah River area. The forecasts are provided utilizing the Air Quality Index (AQI) color scale to indicate levels of ozone in the air. Each category in the AQI is represented by a color and includes a cautionary statement for air quality conditions and the appropriate citizen response. Green represents the level being good, yellow for moderate conditions, orange for unhealthy to sensitive groups, and red for unhealthy to everyone.

South Carolina recognizes the importance of providing our citizens with information on air pollution levels where they live and work. The Department has implemented a comprehensive ozone-forecasting program that is not limited to a few areas but instead covers twenty-six of the forty-six counties in our state. We have partnered with North Carolina's Department of Environment and Natural Resources to provide a forecast for an additional three counties along the State border. Our citizens are alerted on a daily basis during ozone forecasting season as to the predicted quality of the air so that they may take actions as they believe appropriate to better protect their health. We have expended and continue to expend significant resources to provide this service to our citizens. This daily forecast is a much better indication to the public of when they need to act to avoid exposure to high ozone levels than a nonattainment designation, which is a one-time publication in the *Federal Register*.

The forecasts are broadcast on local television and radio stations during the daily weather forecasts, distributed by email or fax to over 300 businesses, industries, organizations, and individuals, and through an agency-created website (www.scdhec.net/baq/ozone). In the high traffic areas surrounding Columbia and Greenville, warnings are also posted on Department of Transportation's message boards along the major interstates. To promote the efforts, Governor Mark Sanford declared the first week of May, 2003, "Ozone Awareness Week." The Department also hosts official "Ozone Season Kick-Off Events" around the state to annually review the warning system and ozone reduction opportunities within South Carolina.

Ozone Education and Outreach

Additionally, other elements that fall under the "Spare the Air" initiative involve education and outreach to school-aged youth and persons with chronic respiratory conditions. In cooperation with the Department's Bureau of Land and Waste Management, air quality training in the environmental curriculum titled "Action for a Cleaner Tomorrow" is provided to teachers across the state. To assist Department efforts in preventing future air pollution, the Bureau of Air Quality staff work with teachers and students through classroom resources such as prepared special lesson plans, presentations, and exhibits. Teachers are also encouraged to participate in the "Ozone Action Classroom" initiative to educate students on the dangers of ground-level ozone. Additional partners in the "Ozone Action Classroom" include the South Carolina Asthma Planning Alliance and the South Carolina Public Health Association. These groups are together, and individually, working to promote awareness of the link between ground-level ozone and air quality conditions that can trigger asthma attacks in persons with respiratory conditions.

Permitting Program

In South Carolina anyone who plans to construct, add to, or alter a source of air contaminants must first submit an application for a permit. Once a construction permit is issued (or construction approved), the applicant may then begin construction after waiting the required time period. Once construction has been completed, the applicant then requests a permit to operate. An operating permit can take several different forms based upon the quantity of the pollutant(s) to be emitted. In South Carolina permits are not only required for "major" sources (sources with emissions exceeding federal thresholds); they are also required for facilities emitting smaller quantities as well. This comprehensive permitting process allows more control over sources of emissions within South Carolina.

Title V Permitting Program

The Clean Air Act Amendments of 1990 included sweeping new revisions requiring all states to develop operating permit programs that meet certain federal criteria. The states, in turn, are to require sources to obtain permits that contain all of their Clean Air Act requirements.

On July 21, 1992, EPA issued a regulation outlining the specific minimum requirements that states must meet in their operating permits program. State and local agencies were required to submit programs to EPA by November 15, 1993, and EPA is required to approve or disapprove these programs within one year of their submittal.

EPA's operating permits regulation requires states to develop comprehensive operating permit programs that cover "major" sources of air pollution. Major sources include (1) those that emit 100 tons/year or more of volatile organic compounds, carbon monoxide, lead, sulfur dioxide, nitrogen dioxide, or particulate matter (PM-10); and (2) those that emit 10 tons/year or more of any single toxic air pollutant (specifically listed under the Clean Air Act), or those that emit 25 tons/year or more of a combination of toxic air pollutants. The primary purpose of the operating permits program is to improve enforcement by issuing each source a permit that consolidates all of the Clean Air Act requirements into a federally enforceable document.

The State of South Carolina received full program approval of its Title V Program on June 26, 1995. In July 2003, EPA Region 4 conducted a comprehensive review of South Carolina's Title V permit program. EPA's review of South Carolina's program found that it was operating at a very high level of proficiency.

New Source Review Permitting

Congress established the New Source Review (NSR) Program as part of the 1977 Clean Air Act Amendments and modified it in the 1990 Amendments. NSR is a preconstruction permitting program that serves two purposes. First, it ensures the maintenance of air quality standards when factories, industrial boilers, and power plants are modified or added. In areas with unhealthy air, NSR assures that new emissions do not slow progress toward cleaner air. In areas with clean air, especially pristine areas like national parks, NSR assures that new emissions fall within air quality standards. Second, the NSR program assures that state of the art control technology is installed at new plants or at existing plants that are undergoing a major modification.

South Carolina has a SIP approved NSR program with its own NSR rules. Therefore, South Carolina has full authority to issue both major and minor NSR permits. Because there are no nonattainment areas in South Carolina at present, the only applicable major NSR permitting regulations are the Prevention of Significant Deterioration (PSD) regulations.

In July 2003, EPA Region 4 conducted a comprehensive review of South Carolina's NSR program. The EPA determined that South Carolina has a thorough and well-organized process for permitting sources and a good comprehension of regulatory requirements and policies.

Smoke Management Program

South Carolina has a Smoke Management Program (SMP) that is certified in accordance with EPA's *Interim Air Quality Policy on Wildland and Prescribed Fires (April 23, 1998)*. The SMP involves coordination between the Department and the South Carolina Forestry Commission when addressing the impact of smoke on air quality by following guidelines that define smoke sensitive areas, amounts of

vegetative debris that may be burned, and atmospheric conditions suitable for burning. The SMP can be used as a management tool for reducing ozone levels.

Government Fleets

In 1992 the U.S. Congress passed legislation to promote the use of alternative fuel vehicles (AFVs). This legislation was passed to improve air quality and reduce the nation's dependence on foreign oil. The new legislation became known as the Energy Policy Act (EPAct). This Act requires that all Federal and State fleets, as well as private sector fuel providers such as utilities, begin purchasing AFVs by 1994. Over a period of seven years, EPAct required a gradual phase-in of the purchase of AFVs. By 2001 EPAct required that 75% of Federal and State fleets be composed of AFVs. To date, South Carolina is in compliance with all EPAct requirements because of a cooperative effort within the State agencies and the operation of a unified State plan. [15]

On October 18, 2001, former Governor Hodges signed an Executive Order in strong support of the use of alternative fuels. The Order states that whenever practical and economically feasible, State agencies use alternative fuels when operating alternative fuel vehicles.

Currently, the State operates 1,370 alternative fuel vehicles. The types of alternative fuel vehicles that the State operates include the Bi-fuel Ford F-150, Flex Fuel Taurus, Dodge Caravan, and Chevrolet S-10 Pick-up. By purchasing alternative fuel vehicles, the State is making a viable effort to reduce mobile source emissions in South Carolina. An ethanol pump has been installed in the Columbia area so that the flex fuel vehicles can provide the designed benefits. The State fleet also operates hybrid vehicles such as the Honda Insight and Toyota Prius.

K. Regional/National Emission Reductions

In addition to the initiatives and regulations that have been implemented to reduce the level of VOC emissions, standards to reduce NO_x levels have also been supported on the national level. New national standards will provide tremendous air quality benefits, particularly those that will address pollution from mobile sources. Mobile source emissions contribute to air pollution in South Carolina. Strong national programs are the only way to adequately, economically, equitably, and reasonably address pollution from this source sector. The Department believes that the implementation of these regulations and reduction efforts will provide significant assistance towards statewide compliance with the air quality standards, especially in the areas where it is needed the most, our urbanized areas.

Standards For Tailpipe Emissions

Tier 2 is a tailpipe emissions rule that sets new and more stringent exhaust standards. This standard focuses on reducing emissions of ozone-forming gases (NO_x and PM) and applies to new passenger cars and light-duty trucks. The phase-in of the tailpipe emissions standards will begin in 2004 for passenger cars and light-duty trucks. This standard will be completely phased-in by 2007. The phase-in period for heavy-duty light trucks (HDLTs) and medium-duty passenger vehicles (MDPVs) begins in 2008. The standard will be completely phased-in for this group by 2009. Tier 2 standards will reduce new vehicle NO_x levels to an average of 0.07 grams/mile. [16]

[15] South Carolina State Budget and Control Board, General Services Division, Office of State Fleet Management
[16] U.S. EPA Office of Transportation and Air Quality

Gasoline Sulfur Standards

The gasoline sulfur standards focus on reducing average sulfur level in gasoline to 30 ppm. Refiners and importers will be required to meet a corporate average gasoline standard of 120 ppm and a cap of 300 ppm beginning in 2004. This standard will then be reduced to 30 ppm with a cap of 80 ppm. Implementation of these standards will be the equivalent of taking 164 million cars off the road. [12]

Standards For Heavy-Duty Engines

The new standard for heavy-duty engines will also help to reduce mobile source emissions. This standard will become 100% effective for diesels beginning in the 2007 model year. Included in this standard is a reduction for NO_x and non-methane hydrocarbons. The reduction requires a reduction of 0.20 gram/brake horse-power-hour (g/bhp-hr). The phase-in period for this requirement will be between 2007 and 2010 for diesel engines.

Highway Diesel Fuel Sulfur Standards

On June 1, 2006, refiners will be required to start producing diesel for use in highway vehicles with a sulfur content of no more than 15 ppm. Highway diesel fuel sold as low sulfur fuel at the terminals will be required to meet the 15 ppm sulfur standard by July 15, 2006. Highway diesel fuel sold as low sulfur fuel by retail station and fleets must meet the 15 ppm sulfur standard by September 1, 2006. By mid 2006, this standard will reduce sulfur levels in diesel by 97 percent.

Non-Road Diesel Engines and Fuel

EPA recently proposed emissions reductions from off-road diesel engines and low-sulfur fuel requirements for these same engines. By 2014 emissions should be reduced by more than 90 percent and when fully phased in, NO_x emissions from this equipment would be reduced by 825,000 tons. Beginning in 2007, the sulfur content in the diesel fuel used in these off-road engines would be reduced from an uncontrolled 3,400 parts per million to 500 ppm in 2007 and then to 15 ppm in 2010. As non-road engines make up 5.21% of the NO_x inventory in South Carolina, emission reductions from this sector will be a tremendous benefit to our air quality.

NO_x SIP Call

The NO_x State Implementation Plan (SIP) Call is the common name given to a final rule that EPA published on October 27, 1998 (63 FR 57355). The rule requires South Carolina and numerous other states to reduce their summertime emissions of NO_x in order to reduce the interstate transport of ozone and its precursors.

To facilitate these reductions, the rule establishes a NO_x budget trading program in which each applicable state is given a summertime NO_x budget which they cannot exceed. The budget for each state assumes certain reductions on specific types of units. The units involved in the trading program are units that serve a generator with a nameplate capacity greater than 25 MWe, referred to as electrical generating units (EGUs); and large boilers that have a maximum design heat input greater than 250 mm Btu/hr, referred to as non-EGUs. The budget for EGUs is based upon 85 percent reductions from uncontrolled levels while the budget for the non-EGU category is based on 60 percent reductions from uncontrolled levels. The rule also calls for controls on cement kilns and large internal combustion engines, but these units are not part of the trading program.

South Carolina's NO_x budget for sources subject to the NO_x SIP Call was reduced from a baseline of

156,137 tons to 128,524 tons. This reflects a drop in overall, summertime NO_x emissions of 18 percent.

The rule allows the regulated community a great deal of flexibility. Rather than dictate the types and levels of controls, sources subject to the rule have the ability to determine where it is most cost effective to apply pollution controls. As a result, there is less certainty for states in terms of predicting where NO_x reductions may occur. So for instance, sources may choose to install pollution control equipment and sell their surplus NO_x allowance or they may choose not to install controls and simply buy the NO_x allowances they need. One significant constraint is that from May 1 to September 30 of each year, units subject to the requirements of the NO_x SIP Call must have an allowance of NO_x for every ton of NO_x that they emit.